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NOSIS, DIFFERENTIAL DIAGNOSIS AND TREATMENT OF DISEASES OF THE EYE

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DIAGNOSIS
DIFFERENTIAL DIAGNOSIS
AND
TREATMENT OF DISEASES OF THE EYE

BY

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The Knickerbocker Press

1894

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1894

PREFACE

My experience with diseases of the eye, while in general practice, and the tedious task of sifting out of the larger text-books the diagnostic symptoms of the different eye diseases, have contributed or led to the compiling of these tables. They are designed more especially for the active practitioner, who does not claim to be an ophthalmologist, or even well posted on diseases of the eye.

Under each disease or condition given will be found the different diseases or conditions with which it is liable to be confounded. Occasionally different varieties of a disease may blend so that a differential diagnosis would be impossible, as neither type could be excluded. Not infrequently two diseases are associated. Usually the symptoms of a disease are all given in its first table, but are not all given in the following tables; they are given with special reference to making the differential diagnosis of the disease found in the opposite column: in other words, the symptoms are given as they are liable to occur when two diseases would be confounded. The diagnostic symptoms being in small capitals are seen at a glance.

Technical terms could not be altogether discarded, as many of them are in general use: as a rule they are all given, but have been relegated to a secondary place.

I am fully aware of the fact, that the nomenclature can be criticised, but I have tried to keep in mind the original idea,—simplicity. The treatment given is not always the latest fads, but what is considered the most reliable.

For the technique of operations, I would refer the reader to some of the most complete works on ophthalmology.

A. E. A.

Newburgh, N. Y.
August, 1894.

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DIFFERENTIAL DIAGNOSIS OF DISEASES OF THE EYE.

Dilatation of Pupil.
(Mydriasis)

MYDRIASIS may be due to :

1. Ingestion of certain drugs, belladonna, ergot, etc.
2. Traumatism with rupture of the sphincter iridis.
3. Intra-ocular pressure.
4. Complete atrophy of the optic nerve.
5. Paralysis of the third nerve.
6. Apoplexia in the later stages.
7. Irritation of the cervical meninges or posterior columns of the cord.
8. Irritation of the cervical sympathetic.
9. Anæmia (rare).
10. Reflex intestinal irritation.
11. Reflex uterine irritation.
12. Acute mania.
13. Melancholia.
14. Progressive paralysis of the insane.

DRUGS which cause MYDRIATIC ACTION if instilled in eye :

Hyoscine.	Gelsemine.
Atropine.	Homatropine.
Duboisine.	Cocaine.
Daturine.	Scopolamine.

Contraction of Pupil.
(Myosis).

MYOSIS may be due to :

1. Ingestion of certain drugs, as opium, alcohol.
2. Convergence and accommodation.
3. Evacuation of the aqueous.
4. Irritation of retina by light.
5. Irritation of brain and meninges.
6. Apoplexia in early stages.
7. Injuries, pressure or degeneration of the post. col. of the spinal cord (cervical portion).
8. Paralysis of cervical sympathetic.
9. Plethora (rare).
10. Irritation of the cornea.
11. Irritation of the iris.
12. Hysterical or epileptic convulsion (early stage).
13. Nicotine in tobacco amblyopia.
14. Long-continued accommodation.

DRUGS which cause MYOTIC ACTION if instilled in eye :

Eserine.
Physostigmine.
Pilocarpine.
Muscarine.

May be confounded with IRITIS, SUB-ACUTE GLAUCOMA.

Simple Catarrhal Conjunctivitis (Catarrhal Ophthalmia).	**Purulent Conjunctivitis** (Blennorrhœa).
1. Lids may or may not swell.	1. Swelling of lids.
2. A dread or intolerance of light *(photophobia)*, in some cases.	2. Photophobia considerable.
3. Lachrymation often profuse, may be slight in mild or chronic cases.	3. Lachrymation usually considerable.
4. Sensation of itching or burning, or as of a foreign body in eye.	4. Pain lancinating, especially if the cornea is involved.
5. DISCHARGE STICKY *(catarrhal)* and usually mixed with a quantity of tears.	5. DISCHARGE PURULENT, and usually profuse.
6. Ocular conjunctiva injected, its vascular network is more prominent, while the palpebral conjunctiva is red and thickened, and at times has the "velvety appearance." There is usually moderate œdema of the conjunctiva *(chemosis)* in all cases, while in some the œdema may be considerable and the injection slight.	6. Ocular and palpebral conjunctiva red, with marked œdema in most cases.
7. LIDS STICK TOGETHER IN THE MORNING.	7. LIDS BATHED IN PUS.
8. Cornea not affected.	8. Cornea often involved.

(Continued on p. 3.)

9. FREQUENTLY EPIDEMIC, and may be contagious; sometimes SECONDARY, or TRAUMATIC.

10. Usually both eyes are affected. One eye may be attacked first.

11. May terminate in a chronic condition *(chronic conjunctivitis)*.

Treatment.

Cleanliness.

Ac. boric sol. (gr. xii.–ʒ i.)

9. ALWAYS CONTAGIOUS WITH SOME KNOWN CAUSE, AS IN OPHTHALMIA NEONATORUM, GONORRHŒAL CONJUNCTIVITIS, and DIPHTHERITIC OR CROUPOUS CONJUNCTIVITIS. If the case is of a diphtheritic or croupous nature, then the conjunctiva throws out, not a purulent and copious secretion, but a fibrinous exudation, and forms a "false membrane."

There will be a scanty purulent secretion covering the membrane.

10. Attacks one eye first.

11. May terminate in ulcer of cornea and loss of vision.

Treatment.

Cleanse thoroughly with ac. boric sol. (gr. xv.–ʒ i.) and repeat as often as pus accumulates in the cul-de-sac.

Ice cloths on lids.

Atropine (gr. iv.–ʒ i.) if cornea is involved.

Ag. nit. (gr. x.–ʒ i.).

Cover the unaffected eye with a glass shield to protect it from contagion.

(Trachoma), (Granular Conjunctivitis), (Granular Ophthalmia).

Non-Vascular Granules.	**Vascular Granulations.**
1. Lids not apparently thickened.	1. Lids slightly thickened, look puffy.
2. Photophobia little if any.	2. A dread or intolerance of light *(photophobia)*.
3. Pain none.	3. Pain is often considerable.
4. Secretion sticky but scanty.	4. Secretion sticky and quite copious.
5. Palpebral conjunctiva pale yellow, or pale pink.	5. Palpebral conjunctiva red, "velvety appearance."
6. Elevations on the conjunctiva are the "*sagograin*" granules; they are gray-white and semi-transparent bodies about the size of a small brass pin head and partially embedded in the pale conjunctiva.	6. Elevations on conjunctiva have a fleshy look, they may be isolated and look like granulation tissue, or they may be grouped in a cluster giving the "velvety appearance." This may be so marked that when the lid is everted there are apparently fissures along the edge of the tarsal cartilage.
7. Ocular conjunctiva nearly normal in many cases.	7. Ocular conjunctiva usually contains enlarged, dark-colored, and tortuous blood-vessels, and if the case is of long standing these vessels extend down on the cornea and is termed *pannus*.
8. Cornea usually clear.	8. In old cases cornea may be found ulcerating, or if the ulcers have healed, then opacities will remain.

(Continued on p. 6.)

9. An acute or active condition may be engrafted on the non-vascular or chronic state and convert it into the vascular form.

Treatment.

Squeeze out the granules with trachoma forceps; or pick out with a sharp pointed instrument.

9. New connective tissue is found in the palpebral conjunctiva; this eventually contracts and leaves scar tissue which rubs on the cornea causing irritation and blepharospasm and sometimes *entropion.*

Treatment.

Glycerite of tannin applied direct to granulations.

Cupri sulph. locally to granules.

Squeeze the granulations with trachoma forceps.

Grattage.

May be confounded with VASCULAR KERATITIS.

Pterygium.

1. Duration years.
2. Vision normal, or at least good.
3. Pain none.
4. Bright light does not, but cold winds may cause a little irritation of eyes.
5. PALPEBRAL CONJUNCTIVA NORMAL.
6. Blood-vessels in conjunctiva are fine and straight, and with connective tissue forms A TRIANGULAR MASS WITH ITS BASE TOWARD THE NOSE AND ITS APEX RESTING ON THE CORNEA.

Treatment.

Operation for removal.

Vascular Keratitis.

1. Duration months.
2. Vision poor.
3. Pain may or may not be severe.
4. Bright light causes irritation and lachrymation of the eyes.
5. PALPEBRAL CONJUNCTIVA usually TRACHOMATOUS OR CICATRIZED.
6. Blood-vessels are large, dark-colored, and tortuous; THEY EXTEND FROM BENEATH THE UPPER LID, DOWN ON THE UPPER PART OF THE CORNEA.

Not infrequently ulcerative keratitis complicates.

Amyloid Degeneration of the Conjunctiva.

NOT CONFOUNDED.

1. Light yellow mass or masses usually in the palbebral conjunctiva.
2. Slow development.

Treatment.

None.

Sarcoma of the Conjunctiva.

NOT CONFOUNDED.

1. May be either a white or pigmented growth, and frequently returns after removal.
2. Rapid development.

Treatment.

Operation for the complete removal of the tumor.

Ecchymosis of the Conjunctiva.

NOT CONFOUNDED.

1. Extravasated blood between the conjunctiva and sclera.

Treatment.

None.

Xerosis.

NOT CONFOUNDED.

1. Conjunctiva is apparently dry, and has lost much of its usual lustre.

Treatment.

No known cure.

May be confounded with EPISCLERITIS.

Scleritis.	Episcleritis.
1. A GENERAL CONGESTION OF THE MORE SUPERFICIAL VESSELS OF THE SCLERA or portions of it.	1. LOCALIZED SWELLING OR INFLAMMATION OF THE EPISCLERAL TISSUE which soon affects the sclera proper.
2. A semi-chronic inflammation which rarely develops into an acute trouble.	2. Color dark red or pink ; the old patches have a purple or lead color.
3. LITTLE OR NO ELEVATION.	3. Conjunctiva and sub-conjunctival tissues are thickened which makes THE PATCH SOMEWHAT ELEVATED.

Treatment.

Mixed treatment.

Rest.

EPISCLERITIS.

May be confounded with SCLERITIS, IRITIS, PHLYCTENULAR CONJUNCTIVITIS.

Episcleritis.	Phlyctenular Conjunctivitis.
1. Light does not irritate the eye.	1. Light may irritate the eye.
2. Pain none.	2. Sensation, burning or itching.
3. SECRETION NONE.	3. SECRETION STICKY (slight).
4. CIRCUMSCRIBED CONGESTION OF A SLIGHTLY ELEVATED PATCH OF CONJUNCTIVA AND EPISCLERAL TISSUE.	4. YELLOW GRAY ELEVATION ON A REDDENED PATCH OF CONJUNCTIVA.
5. NO TENDENCY TO SUPPURATE.	5. TENDENCY TO FORM A MINUTE ABSCESS on elevation ; this ruptures AND A SMALL ULCER RESULTS *(phlyctenular ulcer)*.
6. CHRONIC DISEASE.	6. ACUTE DISEASE.

Treatment.

Anti gouty.

Mixed treatment, salicylate of soda, tonics, atropine, rest.

May be confounded with ABSCESS OF THE CORNEA, PHLYCTENULAR KERATITIS.

Abrasion of the Cornea.	Abscess of the Cornea.
1. Pain usually severe.	1. Pain moderate, or none at all.
2. A dread or intolerance of light *(photophobia)*, with profuse flow of tears *(lachrymation)*, and there may be spasm of the orbicularis muscle *(blepharospasm)*.	2. Light usually fairly well borne with little or no lachrymation and no blepharospasm.
3. Whole conjunctiva may be congested.	3. Circum-corneal injection, may be little or none.
4. CORNEAL HAZINESS DUE TO LOSS OF CORNEAL EPITHELIUM (superficial).	4. CORNEAL HAZINESS DUE TO INFILTRATION BETWEEN THE LAYERS OF THE CORNEA (deep).
5. Corneal opacity due to suppuration and pus on the corneal abrasion; yellow-gray color.	5. Corneal opacity due to pus between the layers of the cornea; yellow-gray color.
6. ABRASION CLEAN-CUT, CIRCUMSCRIBED.	6. EDGES OF ABSCESS NOT SO WELL DEFINED.
7. Corneal surface not smooth, and in the abrasion the lustre is lost.	7. Corneal surface smooth; lustre may be lost over the abscess.
8. No iritis.	8. Iritis often complicates.
9. No complications in early stages.	9. Hypopyon, ulcer of cornea, cyclitis, etc., may complicate.
10. HISTORY OF TRAUMATISM.	10. MAY BE THE RESULT OF TRAUMATISM.

Treatment.

Absolute rest with eye lightly bandaged.

Atropine (gr. ii.–ʒ i.) q. 4 h.

Oils (olive or castor) instilled freely.

Cocaine may be instilled to relieve severe pain.

May be confounded with ABRASION OF CORNEA, INTERSTITIAL KERATITIS, OPACITY OF THE CORNEA.

Phlyctenular Keratitis.	**Abrasion of the Cornea.**
1. Vision may be but little impaired.	1. Vision may be but little impaired.
2. Pain always severe.	2. Pain always severe.
3. A dread or intolerance of light *(photophobia)*, with profuse flow of tears *(lachrymation)*, and spasm of the orbicularis muscle *(blepharospasm)*.	3. Photophobia, lachrymation, and blepharospasm, all in a marked degree.
4. Phlyctenular conjunctivitis frequently associated.	4. Conjunctival injection.
5. CORNEAL OPACITY ELEVATED.	5. CORNEAL OPACITY DEPRESSED.
6. Corneal opacity gray, or yellow-gray.	6. Irregular opacity gray and lustreless from loss of epithelium.
7. Corneal opacity always small and oval.	7. Corneal opacity any size, long, or irregular.
8. NO HISTORY OF TRAUMATISM.	8. HISTORY OF RECENT TRAUMATISM.
9. Duration may be days.	9. Duration usually hours.
10. Children's disease.	10. Any age.
11. Terminates in loss of substance (minute ulcer), which may or may not leave a permanent opacity of the cornea. One, two or three blood-vessels may extend to the "phlyctenular ulcer" *(fascicular keratitis)*.	11. Terminates in epithelium being rapidly restored; or the formation of pus and ulceration on the site of the abrasion.

Treatment.

Attention to hygiene and diet, especially diet.

Treat any nasal catarrh present.

Locally:

Ac. boric. sol. (gr. xii.–℥ i.).
Atropine (gr. ii.–℥ i.).
Ung. hg. ox. fla. (gr. xii.–℥ i.).

Phlyctenular Keratitis.	**Opacity of the Cornea.**
1. Vision may be but little impaired, depends on site of phlyctenule.	1. Vision depends on size and location of the opacity.
2. PAIN ALWAYS SEVERE.	2. PAIN NONE.
3. A DREAD OR INTOLERANCE OF LIGHT WITH PROFUSE FLOW OF TEARS.	3. LIGHT DOES NOT AFFECT THE EYE.
4. Phlyctenular conjunctivitis frequently associated.	4. No conjunctivitis.
5. CORNEAL OPACITY ELEVATED.	5. CORNEAL OPACITY SMOOTH.
6. Corneal opacity yellow or gray.	6. Corneal opacity gray or white.
7. Corneal opacities always small.	7. Corneal opacities may be any size.
8. Blood-vessels may extend to phlyctenule in later stages, or, after it ruptures and becomes a small ulcer.	8. No blood-vessels on or in the cornea.
9. Duration few days.	9. Duration weeks or months.
10. Disease of children.	10. Any age.

Herpes of the Cornea.	**Keratitis Bullosa.**
1. Rare.	1. Rare.
2. Usually adults.	2. Usually adults.
3. Associated with herpes of the face.	3. Associated with some deep inflammation.
4. Ulceration deeper than phlyctenular ulceration.	4. Appears as blebs large or small, and may terminate in ulceration.

Conical Cornea (Kerato-conus).	**Hydrophthalmia** (Kerato-globus) (Buphthalmus).
1. Not infrequent.	1. Rare.
2. Acquired.	2. Congenital (usually).
3. Viewed transversely cornea alone is seen to be conical.	3. Whole cornea and adjacent sclerotic is bulging.
4. Ant. chamber deep.	4. Ant. chamber deep.
5. Iris normal.	5. Iris tremulous.
6. Vision poor.	6. Vision very poor.
7. Cornea clear.	7. Cornea clear, transparent.

May be confounded with ABRASION OF THE CORNEA, ULCER OF THE CORNEA, OPACITY OF THE CORNEA, INTERSTITIAL KERATITIS, HYPOPYON.

Abscess of the Cornea.

1. Vision may or may not be impaired.
2. Pain not usually severe; may be absent.
3. Bright light is liable to irritate the eye.
4. Circum-corneal redness.
5. Corneal opacity gray with possibly a yellow centre.
6. EDGE OF OPACITY NOT SHARPLY DEFINED.
7. CORNEAL SURFACE SMOOTH, with loss of lustre over abscess. *(No loss of substance.)*
8. Blood-vessels may extend to abscess.

Pus may penetrate to the anterior chamber and gravitate to its bottom *(hypopyon)*, or abscess may rupture externally and leave an ulcer, and in a few cases it separates the layers of the cornea and gravitates between them *(onyx)*.

Treatment.

Attention to the general health,

Hot fomentation for a few moments several times a day.

Atropine.

If abscess is large and increasing in size, an incision may be indicated.

Ulcer of the Cornea.

1. Vision may or may not be impaired.
2. Pain usually severe; may be absent.
3. Bright light usually irritates the eye.
4. Circum-corneal redness.
5. Corneal opacity, a yellow-gray depression in cornea.
6. EDGE OF ULCER CLEAN-CUT OR UNDERMINED.
7. CORNEAL SURFACE EXCAVATED *(loss of substance)* with sharp-cut or undermined edges and loss of lustre.
8. Blood-vessels, one or two, usually penetrate to ulcer after a few days.

May be confounded with ABSCESS OF CORNEA, INTERSTITIAL KERATITIS.

Hypopyon.	**Abscess of Cornea.**
1. Vision impaired if hypopyon is large.	1. Vision depends on site of abscess.
2. Pain of hypopyon, *per se*, slight or none.	2. Pain usually slight.
3. Light may be fairly well borne.	3. Light may be well borne.
4. Circum-corneal injection due to other causes.	4. Circum-corneal injection may be slight.
5. OPACITY DUE TO PUS IN ANTERIOR CHAMBER, ONE YELLOW MASS AT ITS LOWEST PART.	5. CORNEAL OPACITY DUE TO PUS BETWEEN THE LAYERS OR IN THE SUBSTANCE OF THE CORNEA.
6. OPACITY ALWAYS BELOW AND ASSUMES THE FORM OF THE LOWEST PORTION OF THE ANT. CHAMBER. If the hypopyon is sufficiently fluid its upper margin is flat or horizontal and IT MAY CHANGE ITS POSITION BY ASSUMING THE RECUMBENT POSTURE, OR CHANGING THE POSITION OF THE HEAD.	6. OPACITY MAY BE IN ANY PORTION OF THE CORNEA, AND MAY ASSUME ANY FORM, BUT IT DOES NOT CHANGE ITS POSITION.
7. Opacity yellow, circumscribed.	7. Opacity yellow centre, gray edges, and not always well defined.
8. Always a result of some other disease, as abscess of the cornea, iritis, etc.	8. Complication following a poor general condition, injuries, etc.

Treatment.

If pus is not absorbed in a reasonable length of time, open the lowest portion of ant. chamber and evacuate it.

May be confounded with ABSCESS OF CORNEA, OPACITY OF CORNEA, INTERSTITIAL KERATITIS.

Sloughing Ulcer of Cornea.	Perforating Ulcer of Cornea.
1. Vision may not be impaired unless ulcer involves centre of cornea.	1. Vision usually impaired, as ulcer is usually central.
2. Pain severe, often referred to brow and temple; may be absent.	2. Pain often severe; may be absent.
3. A dread or intolerance of light *(photophobia)* in most cases.	3. A dread or intolerance of light in most cases.
4. Circum-corneal redness, œdema of conjunctiva *(chemosis)*, and swelling of lids in severe cases.	4. Little if any circum-corneal redness.
5. Corneal lustre lost in and around the excavated ulcer.	5. Corneal lustre lost at edge of ulcer.
6. Corneal opacity is a yellow-gray.	6. Corneal opacity is gray.
7. ULCER IS DEPRESSED OR EXCAVATED, OFTEN COVERS CONSIDERABLE SURFACE, AND IS SHALLOW. TENDENCY TO SPREAD OR CREEP ALONG THE SURFACE OR AROUND THE EDGE OF CORNEA, often called "*serpiginous*" or "*creeping ulcer.*"	7. ULCER IS DEEP AND OF SMALL AREA. TENDENCY TO ULCERATE DEEPER, AND NOT INFREQUENTLY IN SPITE OF ALL TREATMENT IT PERFORATES TO THE ANTERIOR CHAMBER CAUSING "*fistula of the cornea.*" At other times it is arrested when it has reached Descemet's membrane, and intra-ocular pressure may push the membrane forward through the opening *(hernia cornea)* or *(keratocèle)*.
8. Edges are usually undermined.	8. Edges sharp, clean-cut, as if punched out.

(Continued on p. 15.)

9. The whole cornea may ulcerate and hypopyon, iritis, iridocyclitis, panophthalmitis, and phthisis bulbi follow.

9. Cornea may be perforated, ant. chamber empties, iris comes in contact with cornea and becomes attached to it at the site of ulcer *(anterior synechiæ)*.

Treatment.

Attention to the general health.

Ac. boric. sol. (gr. xii.–ʒ i.), or Hg-bi-chlor. spray (1–5000) q. 3 h.

Curetting and then rubbing with ung. hg. ox. fla. (gr. xvi.–ʒ i.).

Actual cautery. Atropine in some cases.

Indolent or Chronic Ulcer of the Cornea.

1. Vision not impaired if ulcer is near margin of cornea.
2. Pain slight or none.
3. Light may be well borne.
4. CIRCUM-CORNEAL REDNESS.
5. A YELLOW-GRAY DEPRESSION IN CORNEA (loss of substance).
6. Corneal lustre lost in and around the depressed ulcer.
7. BLOOD-VESSELS MAY EXTEND TO ULCER.
8. MAY have had previous eye trouble.
9. Duration may have been days or weeks.
10. If ulcer covered considerable area, intra-ocular pressure may cause the weakened cornea to bulge forward *(corneal staphyloma)*.

Opacity of the Cornea.

1. Vision not impaired if opacity is not central.
2. Pain none.
3. Light does not irritate the eye.
4. SCLEROTIC CLEAR, WHITE.
5. CORNEA SMOOTH, SHINING WHITE, OR GRAY.
6. Corneal lustre not usually broken.
7. NO BLOOD-VESSELS SEEN ON OR IN THE CORNEA.
8. HISTORY of previous eye disease.
9. Duration months or years.
10. Opacity crowns corneal staphyloma.

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6. CORNEAL HAZINESS DUE TO DIFFUSE POINTS OR SPECKS IN CORNEAL SUBSTANCE.	6. CORNEA CLEAR EXCEPT AT PHLYCTENULES.
7. CORNEAL OPACITY DUE TO POINTS OR SPECKS OF INFILTRATION IN THE CORNEAL SUBSTANCE, THESE COALESCE AND FORM THE "*ground-glass appearance.*"	7. CORNEAL OPACITY LIMITED TO THE ONE OR MORE SMALL SPOTS.
8. CORNEAL SURFACE SMOOTH BUT LUSTRELESS.	8. PHYLCTENULES ELEVATED, LUSTRE OF THE SURROUNDING CORNEA RETAINED.
9. Corneal surface above (and sometimes below) is often a mottled red color *(salmon patch)*, DUE TO NUMEROUS FINE BLOOD-VESSELS EXTENDING INTO THE SUBSTANCE OF THE CORNEA.	9. BLOOD-VESSELS MAY EXTEND TO THE PHLYCTENULES ; THEY ARE ALWAYS MORE SUPERFICIAL AND LARGER.
10. Iritis occasionally complicates.	10. Iritis none.
11. Fundus seen imperfectly or not at all.	11. Fundus seen perfectly if phlyctenule is not central.
12. Corneal opacity often obstructs all red reflex as seen with the ophthalmoscope.	12. Corneal opacity never completely obstructs red reflex.
13. Usually affects both eyes, one preceding the other.	13. May affect both eyes.
14. Hereditary syphilis.	14. No syphilitic history.
15. Peg or notched teeth.	15. Teeth regular.

Treatment.

Atropine and blue glasses.

Mixed treatment, or hg. oleat. rubbed under arms.

Tonics.

Interstitial Keratitis.	Abscess of the Cornea.
1. Vision impaired.	1. Vision depends on site of abscess.
2. Pain increases as the cornea is involved.	2. Pain usually slight.
3. Photophobia, lachrymation, and blepharospasm.	3. Photophobia little or none.
4. Circum-corneal injection.	4. Circum-corneal injection.
5. Conjunctivitis none.	5. Conjunctivitis rare.
6. Corneal HAZINESS due to points or specks in corneal substance.	6. Corneal HAZINESS due to infiltration between layers of cornea.
7. CORNEAL OPACITY HAS THE "GROUND-GLASS" APPEARANCE AND IN IT ARE SEEN POINTS OR SPECKS WHERE THE OPACITY IS MORE DENSE.	7. CORNEAL OPACITY DUE TO PUS BETWEEN THE LAYERS OF, OR IN THE CORNEAL TISSUES.
8. CORNEAL OPACITY DIFFUSE.	8. CORNEAL OPACITY MORE CIRCUMSCRIBED.
9. Corneal surface smooth but lustreless.	9. Corneal surface smooth; lustre lost over the site of abscess.
10. CORNEAL OPACITY WHITE OR GRAY.	10. CORNEAL OPACITY YELLOW-GRAY.
11. NUMEROUS FINE BLOOD-VESSELS MAY PENETRATE CORNEAL SUBSTANCE.	11. ISOLATED BLOOD-VESSELS MAY PENETRATE TO THE ABSCESS.
12. Iritis occasionally complicates.	12. Iritis frequently complicates.
13. Fundus seen imperfectly or not at all.	13. Fundus seen through clear cornea by the side of abscess.
14. Corneal opacity obstructs the red reflex.	14. Red reflex rarely all obstructed.
15. Usually attacks both eyes, one eye affected first.	15. One eye.
16. Hereditary syphilis.	16. No hereditary syphilis.
17. Peg or notched teeth.	17. Teeth regular.
18. No history of traumatism.	18. May have history of traumatism or some disease preceding.

Interstitial Keratitis.	Ulcer of the Cornea.
1. Vision impaired.	1. Vision depends on site of ulcer.
2. Pain may or may not be severe; increases as the cornea is involved.	2. Pain may or may not be severe.
3. Photophobia, lachrymation, and blepharospasm.	3. Photophobia, and usually lachrymation and blepharospasm.
4. Circum-corneal injection.	4. Circum-corneal injection if ulcer is active (acute).
5. Conjunctivitis none.	5. Conjunctivitis, unless ulcer is indolent (chronic).
6. CORNEAL OPACITY HAS THE "*ground-glass*" APPEARANCE, AND IN IT ARE SEEN POINTS OR SPECKS WHERE THE OPACITY IS MORE DENSE.	6. CORNEAL OPACITY IS A DISTINCT PATCH OR PATCHES, SURROUNDED BY HEALTHY CLEAR CORNEA.
7. CORNEAL SURFACE SMOOTH BUT LUSTRELESS.	7. CORNEAL SURFACE EXCAVATED (loss of substance); EDGES OF EXCAVATION IN CORNEA ARE CLEAN-CUT OR UNDERMINED.
8. CORNEAL OPACITY WHITE-GRAY (infiltration).	8. CORNEAL OPACITY YELLOW-GRAY (pus).
9. NUMEROUS FINE BLOOD-VESSELS MAY PENETRATE CORNEA.	9. TWO OR THREE BLOOD-VESSELS MAY PENETRATE TO THE ULCER.
10. Iritis occasionally complicates.	10. Iritis rare.
11. Fundus seen imperfectly, if seen at all.	11. Fundus seen through the healthy cornea by the side of ulcer.
12. Corneal opacity often obstructs all red reflex.	12. Red reflex seen through the healthy cornea by the side of ulcer.
13. Usually attacks both eyes; one eye affected first.	13. One eye affected.
14. Hereditary syphilis.	14. No hereditary syphilis.
15. Peg or notched teeth.	15. Teeth regular.
16. No history of traumatism.	16. May have history of traumatism.

[illegible] ...een perfectly.

[illegible] ...ually obstruct [illegible]

[illegible]

[illegible] ...raumatism [illegible] ...ncating.

May be confounded with INTERSTITIAL KERATITIS.

Punctate Keratitis.	**Interstitial Keratitis.**
1. Vision impaired but little.	1. Vision impaired.
2. Pain none.	2. Pain may or may not be severe.
3. Bright light may not irritate the eye.	3. A dread or intolerance of light.
4. Circum-corneal injection may be slight.	4. Circum-corneal injection marked.
5. Corneal opacity due to DEPOSITS ON OR IN THE POSTERIOR LAYER OF THE CORNEA ("Descemets membrane"). These deposits when seen with the ophthalmoscope LOOK LIKE FINE BLACK PEPPER SPRINKLED ON THE CORNEA, *but if seen* BY OBLIQUE LIGHT THEY APPEAR GRAYISH WHITE.	5. Corneal OPACITY DUE TO DIFFUSE POINTS OR SPECKS OF INFILTRATION IN THE CORNEAL SUBSTANCE, and as seen BY OBLIQUE LIGHT HAVE A LIGHT GRAY COLOR.
6. Corneal surface smooth and with NO LOSS OF LUSTRE.	6. Corneal surface smooth but LUSTRELESS.
7. Corneal opacity never dense, seen most on lower part of cornea.	7. Corneal opacity increases as disease advances.
8. Red reflex always seen when examined with the ophthalmoscope.	8. Red reflex obstructed, or lost by dense opacity.
9. If not due to hereditary syphilis, it is always associated with deeper inflammations.	9. Hereditary syphilis.

Treatment.

Mixed treatment; or,
Treat the cause.

May be confounded with CATARACT, ULCER OF CORNEA, ABSCESS OF CORNEA, INTERSTITIAL KERATITIS, PHLYCTENULAR KERATITIS, ARCUS SENILIS.

Opacity of the Cornea.	**Interstitial Keratitis.**
1. Vision impaired according to size and location of opacity.	1. Vision always impaired.
2. PAIN NONE.	2. PAIN SLIGHT; INCREASES AS CORNEA IS INVOLVED.
3. LIGHT DOES NOT AFFECT THE EYE.	3. A DREAD OR INTOLERANCE OF LIGHT.
4. NO CIRCUM-CORNEAL REDNESS.	4. CIRCUM-CORNEAL INJECTION.
5. Corneal opacities one or more; if dense, usually circumscribed, white, and glistening; and if of considerable size is called "*leucoma*"; if iris is adherent to corneal opacity, it is called "*leucoma adherens.*" If the opacity is thin, it appears of a grayish color, is usually diffuse or at least not circumscribed, and is called a "*nebula.*"	5. Corneal opacity of "ground-glass" appearance and not circumscribed.
6. NO BLOOD-VESSELS ON OR IN CORNEA.	6. FINE BLOOD-VESSELS MAY PENETRATE SUBSTANCE OF CORNEA.
7. NO INFLAMMATORY SYMPTOMS.	7. INFLAMMATORY SYMPTOMS SOON DEVELOP.
8. Previous history of eye trouble.	8. May or may not have had previous eye trouble.
9. One or both eyes.	9. Usually both eyes affected after a time.
10. No syphilitic history.	10. Hereditary syphilis.
11. Teeth normal.	11. Teeth peg or notched.

Treatment.

If case is recent, dust calomel on the opacity, or use the ung. hg. ox. fla. (gr. xii.–ʒ i.).

Opacity of the Cornea.

1. Vision impaired according to the size and location of the opacity.
2. No pain or photophobia.
3. No circum-corneal redness.
4. CORNEAL OPACITY SMOOTH, SHINING WHITE; WHITE, OR GRAY.
5. Corneal lustre may not be broken.
6. DURATION SEVERAL WEEKS.
7. Previous history of eye disease.

Abscess of the Cornea.

1. Vision impaired according to the size and location of abscess.
2. Pain and photophobia may be little or none.
3. Circum-corneal injection may be absent.
4. CORNEAL OPACITY DULL YELLOW-GRAY.
5. Corneal lustre lost over abscess.
6. DURATION A FEW DAYS.
7. No previous history of eye trouble.

Arcus Senilis.

1. Rare before fifty years of age.
2. OPACITY SYMMETRICAL IN EACH EYE, AND MOST DENSE ON THE SUP. AND INF. BORDERS OF CORNEA.
3. No previous history of eye trouble.

Treatment. None.

Opacity of the Cornea.

1. Any age.
2. USUALLY ONE EYE AND NOT REGULAR.
3. Previous history of eye disease.

Conical Cornea.

1. Pain and photophobia none.
2. CORNEA CLEAR.
3. Cornea is conical.
4. Ant. chamber deep.
5. Vision very poor.
6. Near-sighted, improved a little by concave glasses.
7. No previous history of painful eye disease.

Treatment. None.

Corneal Staphyloma.

1. Pain and photophobia none.
2. CORNEA OPAQUE, OPACITY USUALLY COVERS THE WHOLE OF STAPHYLOMA IF NOT THE WHOLE OF CORNEA.
3. A portion of cornea is bulging.
4. Ant. chamber deep.
5. Vision very poor or lost.
6. Vision not usually improved by glasses.
7. Previous history of painful eye disease.

Treatment. None, or operation.

May be confounded with ACUTE GLAUCOMA, SYMPATHETIC INFLAMMATION, CONJUNCTIVITIS, PHLYCTENULAR CONJUNCTIVITIS, KERATITIS, EPISCLERITIS, SEROUS IRITIS.

Iritis.	**Phlyctenular Conjunctivitis.**
1. Vision impaired.	1. Vision normal.
2. Pain may be absent, but is usually severe, extending to nose, brow, and temple.	2. Pain, if *any*, is confined to the eyeball.
3. Bright light usually irritates the eye *(photophobia)*.	3. Bright light rarely irritates the eyes sufficient to cause spasm of the orbicularis (blepharospasm).
4. Lachrymation profuse, with "a cold in the nose" on the affected side.	4. Lachrymation in some cases.
5. SECRETION NOT STICKY.	5. SECRETION STICKY.
6. NO ELEVATION ON CONJUNCTIVA.	6. YELLOW-GRAY ELEVATION ON A REDDENED PATCH OF CONJUNCTIVA.
7. Œdema of lids, and conjunctiva *(chemosis)*, not infrequent in severe cases.	7. Œdema rare.
8. In some severe cases the cornea becomes affected *(kerato-iritis)*.	8. Phlyctenular keratitis may complicate.
9. CIRCUM-CORNEAL INJECTION, DEEP.	9. NO CIRCUM-CORNEAL INJECTION.
10. Eyeball is painful to touch.	10. Eyeball not painful to touch.
11. AQUEOUS USUALLY TURBID OR "MUDDY."	11. AQUEOUS CLEAR.
12. PUPIL SLUGGISH OR STATIONARY, DOES NOT RESPOND TO BRIGHT LIGHT, AND IS ALMOST INVARIABLY CONTRACTED *(myosis)*.	12. PUPIL NORMAL AND RESPONDS TO LIGHT.

(Continued on p. 26.)

13. IRIS DISCOLORED, AND USUALLY ADHERENT TO THE CRYSTALLINE LENS *(post. synechiæ)*. The attachment may be complete all around the free edge of iris *(exclusion of pupil)*, or exudation may block the whole pupil *(occlusion of pupil)*.	13. IRIS NOT DISCOLORED.
14. TENSION MAY BE INCREASED (T. +). ATROPINE INSTILLED CAUSES DILATATION OF THE PUPIL *(mydriasis)*. THE DILATATION IS USUALLY IRREGULAR, showing the adhesions between the iris and lens *(post. synechiae)*; IF ANY OF THESE ADHESIONS ARE BROKEN, A DEPOSIT OF PIGMENT REMAINS ON THE LENS AND MARKS THE PLACE OF FORMER ATTACHMENT.	14. TENSION NEVER INCREASED. ATROPINE DILATES THE PUPIL REGULARLY. NO POST. SYNECHIÆ.
15. Fundus seen imperfectly.	15. Fundus seen perfectly.
16. Disease of adults. If ciliary body is involved it is called *irido-cyclitis* (see iridocyclitis, page 31). If choroid is involved it is called *irido-choroiditis* (see choroiditis, page 56–57).	16. Disease of children, rarely seen in adults.

Treatment.

1. Atropine (gr. ii.–℥ i.).
2. Absolute rest of eye.
3. Colored glasses.
4. Leech to temple to relieve pain.
5. Hot-water fomentation for 5 m. q. 2 h.
6. Operation of iridectomy is indicated in a few rare cases.
7. Constitutional treatment.
   - Anti syphilitic ("one half of the cases").
   - Anti rheumatic.
   - Anti malarial.

Iritis.	Conjunctivitis.
1. Vision impaired by exudation in pupil.	1. Vision may be impaired by mucus on the cornea.
2. Pain often severe, extending to nose, brow, and temple.	2. Pain, itching, burning, or smarting, and confined to eyeball.
3. Pain most at night.	3. Pain less at night.
4. Bright light irritates the eye.	4. Bright light usually irritates eyes.
5. Lachrymation usually profuse with "cold in the nose" on the affected side.	5. Lachrymation may be pronounced.
6. SECRETION NOT STICKY.	6. SECRETION STICKY WITH SCALES DRIED ON EDGES OF LIDS; OR, MUCO-PURULENT AND COPIOUS.
7. Odema of conjunctiva *(chemosis)* not infrequent.	7. Chemosis not infrequent, and in purulent cases may be marked.
8. CIRCUM-CORNEAL INJECTION, DEEP.	8. WHOLE CONJUNCTIVA RED; INJECTION SUPERFICIAL.
9. USUALLY ONE EYE AFFECTED.	9. USUALLY BOTH EYES AFFECTED.
10. Tension often increased.	10. Tension normal.
11. Globe painful to touch, in severe cases.	11. Globe not painful to touch.
12. PUPIL SLUGGISH OR STATIONARY, AND CONTRACTED.	12. PUPIL NORMAL.
13. IRIS DISCOLORED.	13. IRIS NORMAL.
14. AQUEOUS "MUDDY."	14. AQUEOUS NORMAL.
15. EXUDATION MAY OR MAY NOT BLOCK THE PUPIL.	15. PUPIL CLEAR.
16. POST. SYNECHIÆ SEEN IN MOST OF THE OLD CASES.	16. POST. SYNECHIÆ NONE.
17. PIGMENT DEPOSITS MAY BE SEEN ON LENS.	17. CRYSTALLINE LENS CLEAR.
18. Fundus seen imperfectly or not at all, on account of exudation in pupil.	18. Fundus may be seen imperfectly on account of mucus on the cornea.
19. DISEASE OF ADULTS.	19. DISEASE OF ALL AGES.

Iritis.	Episcleritis.
1. Vision impaired.	1. Vision normal..
2. Pain may extend to nose, brow, and temple.	2. Pain usually absent.
3. BRIGHT LIGHT IRRITATES THE EYE.	3. BRIGHT LIGHT MAY IRRITATE THE EYE.
4. LACHRYMATION PROFUSE, MODERATE, OR POSSIBLY NONE.	4. LACHRYMATION NONE.
5. CIRCUM-CORNEAL INJECTION.	5. CIRCUMSCRIBED SUB-CONJUNCTIVAL INJECTION.
6. NO ELEVATION ON CONJUNCTIVA.	6. CIRCUMSCRIBED BROAD, FLAT ELEVATION OF CONJUNCTIVA.
7. Globe may be painful to touch.	7. Globe not painful to touch.
8. Tension often increased.	8. Tension normal.
9. PUPIL SLUGGISH OR STATIONARY AND USUALLY CONTRACTED.	9. PUPIL NORMAL.
10. IRIS DISCOLORED.	10. IRIS NORMAL.
11. AQUEOUS OFTEN "MUDDY."	11. AQUEOUS CLEAR.
12. EXUDATION MAY OR MAY NOT BLOCK PUPIL.	12. PUPIL CLEAR ; BLACK.
13. POST. SYNECHIÆ IN OLD CASES.	13. POST. SYNECHIÆ NONE.
14. Fundus seen imperfectly.	14. Fundus seen perfectly.

Iritis.	**Keratitis.**
1. Vision impaired.	1. Vision impaired.
2. Pain may or may not be severe; may extend to nose, brow, and temple.	2. Pain usually severe but confined to the eyeball.
3. Pain most at night.	3. Pain less at night.
4. Bright light irritates the eye.	4. Bright light irritates the eye.
5. Lachrymation profuse.	5. Lachrymation profuse.
6. Œdema of lids and conjunctiva not infrequent in severe cases.	6. Œdema of lids and conjunctiva not infrequent.
7. Circum-corneal injection.	7. Circum-corneal injection.
8. Usually one eye affected.	8. Usually one eye affected first.
9. Globe painful to touch.	9. Globe not painful to touch.
10. Tension often increased.	10. Tension normal.
11. PUPIL SLUGGISH OR STATIONARY, AND CONTRACTED.	11. PUPIL NORMAL.
12. IRIS DISCOLORED.	12. IRIS NORMAL.
13. AQUEOUS "MUDDY."	13. AQUEOUS CLEAR.
14. EXUDATION BLOCKING PUPIL IN MANY CASES.	14. PUPIL CLEAR AND BLACK.
15. POST. SYNECHIÆ.	15. NO POST. SYNECHIÆ.
16. PIGMENT, THE REMAINS OF OLD SYNECHIÆ ARE OFTEN SEEN ON LENS.	16. CRYSTALLINE LENS CLEAR.
17. Fundus seen imperfectly on account of exudation in pupil.	17. Fundus seen imperfectly on account of changes in the cornea.
18. CORNEA CLEAR.	18. CORNEA CHANGED ACCORDING TO THE FORM OF KERATITIS.
19. DISEASE OF ADULTS.	19. DISEASES OF ALL AGES.

May be confounded with PLASTIC IRITIS, INTERSTITIAL KERATITIS.

Serous Iritis.	**Plastic Iritis.**
1. Vision impaired.	1. Vision impaired.
2. Pain often severe.	2. Pain usually severe extending to nose, brow, and temple.
3. Bright light irritates the eye *(photophobia)*.	3. Bright light irritates the eye.
4. Œdema of conjunctiva *(chemosis)* and lids in severe cases.	4. Œdema of conjunctiva and lids not infrequent.
5. Circum-corneal injection.	5. Circum-corneal injection.
6. PUPIL SLUGGISH OR DILATED.	6. PUPIL SLUGGISH AND CONTRACTED.
7. POINTS OR DOTS OF OPACITY ON DESCEMET'S MEMBRANE *(Descemitis)*.	7. CORNEA CLEAR.
8. Iris discolored little if any.	8. Iris discolored.
9. May have slightly "muddy" aqueous.	9. Aqueous "muddy."
10. ANT. CHAMBER DEEP.	10. ANT. CHAMBER OF NORMAL DEPTH.
11. Little or no exudation in pupil.	11. Exudation usually blocks pupil.
12. Post. synechiæ rare.	12. Post. synechiæ common.
13. Inflammation of ciliary body or choroid or both.	13. Ciliary body may be involved *(irido-cyclitis)*.
14. TENDERNESS ON PRESSURE.	14. MAY HAVE SOME TENDERNESS ON PRESSURE.
15. Result of rheumatism, gout, syphilis, or sympathetic inflammation.	15. May be specific, rheumatic, or gonorrhœal.

Treatment. Local and constitutional.

Atropine cautiously.

Hot fomentations.

Treat vigorously any constitutional trouble; or enucleate an irritating eye.

Serous Iritis.	**Interstitial Keratitis.**
1. Vision impaired.	1. Vision impaired.
2. Pain often severe.	2. Pain usually severe, but possibly little or no pain in early stages.
3. Bright light irritates the eye.	3. Bright light irritates the eye.
4. ŒDEMA OF CONJUNCTIVA AND LIDS IN SEVERE CASES.	4. ŒDEMA OF LIDS NONE.
5. Circum-corneal injection.	5. Circum-corneal injection.
6. CORNEAL LUSTRE NORMAL.	6. CORNEAL LUSTRE LOST.
7. Points or dots of opacity on Descemet's membrane *(Descemitis)*.	7. Corneal haziness due to points or specks in corneal substance; these coalesce and form the "*ground-glass*" appearance.
8. Iris discolored little if any.	8. Iris not discolored.
9. Aqueous may be slightly "muddy."	9. Aqueous clear.
10. Fundus seen perfectly in many cases.	10. Fundus seen imperfectly or not at all.
11. DESCEMITIS NEVER DENSE ENOUGH TO OBSTRUCT, RED REFLEX.	11. CORNEAL OPACITY MAY OBSTRUCT RED REFLEX.
12. Inflammation of ciliary body or choroid, one or both.	12. Iritis and cyclitis may complicate.
13. Syphilis (acquired), rheumatism, or sympathetic inflammation.	13. Hereditary syphilis.

IRIDO-CYCLITIS.

May be confounded with ACUTE GLAUCOMA.

Irido-Cyclitis.	**Acute Glaucoma.**
1. Vision impaired rapidly over the whole field.	1. Vision impaired rapidly, especially on the nasal side of field.
2. PAIN may not be severe for the first few days, but later it is severe and is REFERRED TO THE EYEBALL, BROW, AND TEMPLE.	2. PAIN is severe and EXTENDS TO THE TEMPLE AND SIDE OF THE HEAD, OFTEN CAUSING NAUSEA.
3. A dread or intolerance of light *(photophobia)*.	3. Photophobia.

(Continued on p. 32.)

4. Lachrymation profuse.
5. NO COLORED RINGS OR HALO ROUND ARTIFICIAL LIGHTS.
6. Inability to do close work, develops as disease increases *(failure of accommodation)*.
7. Œdema of lids and conjunctiva.
8. Circum-corneal injection.
9. TENDERNESS ON PRESSURE OVER CILIARY REGION, MAY BE CONFINED TO ONE SPOT.
10. Cornea may be hazy (Descemitis).
11. Aqueous " muddy."
12. ANTERIOR CHAMBER DEEP.
13. PUPIL usually CONTRACTED and adherent to crystalline lens *(post. synechiæ)* by exudation.
14. IRIS INFILTRATED AND DISCOLORED.
15. May have hypopyon.
16. Vitreous may be hazy.
17. Fundus not well seen on account of exudation in pupil and hazy vitreous ; choroiditis may complicate.
18. TENSION MAY BE + or —.
19. ANY AGE.

Glaucomatous symptoms may develop at any moment.

Treatment.

Atropine.

Absolute rest.

Hot-water fomentation for 5 m. q. 2. h.

Leech to temple to relieve pain.

4. Lachrymation when light irritates the eye.
5. COLORED RINGS OR HALO ROUND ARTIFICIAL LIGHTS.
6. Failure of accommodation.
7. Œdema of lids and conjunctiva.
8. Circum-corneal injection.
9. NO TENDERNESS IN CILIARY REGION.
10. Cornea dim, in some cases.
11. Aqueous may be turbid.
12. ANTERIOR CHAMBER SHALLOW.
13. PUPIL DILATED if case is at all severe.
14. IRIS NOT DISCOLORED.
15. No hypopyon.
16. Vitreous may be hazy.
17. Fundus not always well seen on account of *hazy lens*, but if seen will show the *characteristic cupping of disc* ; see page (72).
18. TENSION +.
19. AGE OVER 40

Gumma of Iris.

1. A circumscribed deposit or elevation on iris.
2. COLOR varies from YELLOW TO DARK RED.
3. Symptoms of iritis.
4. HISTORY OF SYPHILIS.
5. RESPONDS TO TREATMENT.
6. NOT UNCOMMON.

Treatment.

Mixed treatment.

Hydrarg. oleat. rubbed in axilla at night.

Miliary Tubercle of Iris.

1. A small elevation on iris.
2. COLOR GRAYISH RED.
3. Symptoms of iritis.
4. HISTORY OF TUBERCLE OF LUNGS OR MENINGES.
5. DOES NOT RESPOND TO TREATMENT.
6. VERY RARE.

Treatment.

Treat the general condition.

COLOBOMA OF IRIS.

Coloboma of Iris.

1. Pupil irregular and extending to edge of cornea on one side.
2. USUALLY ASSOCIATED WITH COLOBOMA OF CHOROID.
3. NO PREVIOUS HISTORY OF AN OPERATION TO REMOVE A PORTION OF THE IRIS.

Treatment.

None.

Iridectomy.

1. Pupil irregular and extending to edge of cornea on one side.
2. NO COLOBOMA OF CHOROID.
3. HISTORY OF PREVIOUS OPERATION TO REMOVE A PORTION OF IRIS.

Treatment.

None.

May be confounded with OPACITY OF THE CORNEA, DETACHED RETINA.

Nuclear Cataract.

1. VISION BETTER IN TWILIGHT.
2. VISION IMPAIRED IN THE EARLIEST STAGES.
3. Vision gradually failing.
4. ONE CENTRAL OPACITY (diffuse), WITHOUT WELL DEFINED EDGES.
5. Color by oblique light is white, or light gray.
6. Color if examined with ophthalmoscope is dark gray, or grayish white.

Treatment.

Operation for extraction when cataract is "ripe."

Cortical Cataract.

1. VISION NOT AFFECTED BY LIGHT.
2. VISION UNIMPAIRED IN THE EARLIEST STAGES.
3. Vision fails rapidly in later stages.
4. OPACITIES SEEN FIRST AT PERIPHERY OF THE LENS, and as it advances WELL DEFINED LINES PROJECT TOWARD ITS CENTRE.
5. Color by oblique light is white.
6. Color if examined with the ophthalmoscope: the lines appear almost black as seen against the red reflex from the retina.

Anterior Polar Cataract (Pyramidal cat.).

1. Vision impaired.
2. OVAL OR CIRCULAR OPACITY ON THE ANTERIOR SURFACE OF LENS.
3. Color milk white or grayish white if seen by oblique light.
4. Ophthalmoscope shows dark opacity instead of white.

NOT INFREQUENTLY OPACITY IS OF A CONICAL FORM, "PYRAMIDAL."

Treatment.

None.

Posterior Polar Cataract.

1. Vision impaired.
2. Small ROUND OR STAR-SHAPED OPACITY ON POSTERIOR SURFACE OF LENS.
3. Color gray or bluish white, NOT USUALLY WELL SEEN BY OBLIQUE LIGHT.
4. Ophthalmoscope shows dark opacity instead of white.

Treatment.

None.

Cataract.

1. Vision impaired.
2. Vision gradually failing.
3. NO PREVIOUS HISTORY OF EYE DISEASE.
4. OBLIQUE LIGHT SHOWS CLEAR CORNEA.
5. Oblique light shows clear aqueous in front of opacity.
6. OPACITY DOES NOT COVER ANY PORTION OF THE IRIS.

OPHTHALMOSCOPIC EXAMINATION:

7. OPACITY MAY PARTIALLY OR WHOLLY DISAPPEAR BEHIND THE EDGE OF IRIS WHEN THE EYE IS ROTATED.

Opacity of the Cornea.

1. Vision may or may not be impaired.
2. Vision not failing.
3. PREVIOUS HISTORY OF PAINFUL EYE DISEASE.
4. OBLIQUE LIGHT SHOWS WHITE OR GRAY OPACITY ON THE CORNEA.
5. Oblique light shows clear aqueous behind opacity.
6. OPACITY COVERS A PORTION OF THE IRIS.

OPHTHALMOSCOPIC EXAMINATION:

7. OPACITY DOES NOT DISAPPEAR WHEN THE EYE IS ROTATED.

Soft Cataract.

Age under 30.

Usually whole lens is opaque.

Pupil appears gray.

With oblique light the opacity is milky, or bluish white, and may have a flocculent appearance.

Treatment.

Operation of "discission," by passing a knife needle through the cornea and rupturing the ant. capsule.

Traumatic Cataract.

History of injury.

Opacity of a portion, or the whole lens.

Soft lens matter may exude from the wound in the capsule, and drops down in anterior chamber, if any of it rests against the iris it may, or usually does cause iritis.

May be CONGENITAL (Ectopia Lentis), ACQUIRED (by disease), or TRAUMATIC.

Complete Dislocation into Vitreous *(aphakia)*.	**Partial Dislocation.**
1. Vision impaired.	1. Vision impaired, especially one portion of the field.
2. Accommodation lost.	2. Accommodation impaired.
3. Anterior chamber deep.	3. Anterior chamber deep on one side, while the iris may be pushed toward cornea on the opposite side.
4. Iris tremulous *(iridodonesis)*.	4. Iris may be tremulous on one side.
5. If lens is sufficiently opaque it MAY be seen by oblique light.	5. If lens is opaque it is seen by oblique light.
OPHTHALMOSCOPIC EXAMINATION:	OPHTHALMOSCOPIC EXAMINATION:
6. If lens is NOT OPAQUE it MAY be seen and has the appearance of a "drop of oil" or a "bubble" in the vitreous.	6. If lens is NOT OPAQUE ONE EDGE MAY BE SEEN; IT HAS THE APPEARANCE OF A DARK CURVED LINE AND IS NEVER SEEN IN A NORMAL EYE.
7. If lens is opaque it looks light, or dark gray, according to the amount of opacity; if the eye is turned quickly it may float up and down in the vitreous, or it may be adherent by exudation to some portion of the fundus and its movements restricted; its freedom of movement usually indicates the fluidity of the vitreous; other floating opacities are usually seen.	7. If lens is opaque it looks light or dark gray, according to the amount of opacity. Sometimes it is seen to move when the eye is turned quickly. Not infrequently the crystalline lens is tilted on its axis (it could not be termed a dislocation), and causes a lenticular astigmatism.

(Continued on p. 37).

Complete Dislocation into Anterior Chamber.

1. Vision impaired.
2. Accommodation lost.
3. Anterior chamber deep.
4. Iris MAY be normal, but it is usually irritated by the foreign body in the ant. chamber.
5. Pupil contracted.
6. If lens is not opaque it gives the appearance of a "drop of oil" or a "bubble" in the anterior chamber.
7. If opaque it appears gray or almost white, and is seen without the aid of instruments.
8. Iritis usually complicates.
9. It has been confounded with hypopyon.

Treatment.

Lens in the vitreous or anterior chamber should be extracted if it is causing irritation.

A partial dislocation of lens should not be disturbed.

1. Specks apparently floating before the eyes.
2. No other symptoms.
3. No ophthalmoscopic appearances to indicate trouble.
4. Not a pathological condition.
5. Never causes any serious trouble.

OPACITIES IN THE VITREOUS.

May be confounded with CHOLESTERINE CRYSTALS, CATARACT.

Small Floating Opacities.

1. Specks or shreds apparently floating before the eyes.
2. Sight impaired by specks, or opacities getting in the line of vision.

OPHTHALMOSCOPIC APPEARANCES:

3. ONE OR MANY BLACK SPECKS OR SHREDS FLOATING IN THE VITREOUS. Not infrequently the opacities are so fine that it is difficult to see them individually, but collectively they cause a *hazy vitreous*. If the inflammation *(hyalitis)* is sufficient it causes a fluid vitreous *(synchisis)*.
4. Choroiditis is usually associated.
5. Most cases are myopic.

Treatment.

Mixed treatment.

Cholesterine Crystals.

1. In certain lights and conditions a "shower of sparks" may apparently float before the eyes.
2. Sight impaired in most of the cases.

OPHTHALMOSCOPIC APPEARANCES:

3. A comparatively clear vitreous and floating in it AN INNUMERABLE NUMBER OF SHINING YELLOW WHITE BODIES *(crystals of cholesterine)*. When the eye is rotated these crystals move about in the vitreous and finally appear to settle down *(synchisis scintillans)*.
4. Choroiditis may not be apparent.
5. Some cases are myopic.

Treatment.

None.

Membranous Opacity.	**Nuclear Cataract.**
1. Vision impaired.	1. Vision impaired.
2. APPEARANCE OF A CLOUD OR CURTAIN DROPPING BEFORE THE EYE.	2. VISION ABOUT THE SAME AT ALL TIMES.
3. "Oblique light" shows in most cases a clear black pupil.	3. Oblique light shows a white or gray opacity in pupil.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
4. A large dark gray or almost black mass in the vitreous, or, if the membranous opacity is sufficiently large and dense to reflect the light, the opacity will appear gray or white.	4. A dark opacity in pupil, or, if lens is sufficiently opaque to reflect the light, it appears gray or white.
5. OPACITY MOVES IN THE OPPOSITE DIRECTION FROM WHICH THE EYE IS ROTATED.	5. OPACITY MOVES IN THE SAME DIRECTION AS EYE IS ROTATED.
6. OPACITY MOVES AFTER THE EYE IS FIXED OR STILL, AND SEEMS TO FLOAT BACK INTO ITS ORIGINAL POSITION.	6. OPACITY MOVES ONLY WHEN EYE IS MOVING.
7. Usually a history of previous eye trouble.	7. No previous eye trouble.
8. Age may be under 40.	8. Age usually over 40.

With Rupture of the Choroid.

1. DIRECT INJURY TO THE EYEBALL.

2. Vision impaired according to the amount of hemorrhage.

3. Ophthalmoscope may be negative on account of blood in the vitreous or ant. chamber or both, and all appears dark.

   Later as the blood is absorbed the red reflex may be seen, and finally the whole fundus; IN THE FUNDUS WILL BE SEEN AN IRREGULAR YELLOW-WHITE BAND OR STRIPE (the rupture of choroid).

   The rupture is most frequent on the temporal side and above; it is usually curved, with its concavity towards the disc, and not infrequently black pigment is seen adhering to its edges.

4. Vision often fairly good after the blood is absorbed.

Treatment.

Absolute rest.
Eyes bandaged.
Atropine.

Without Rupture of the Choroid.

1. MAY HAVE AN INJURY OF THE EYEBALL BUT USUALLY IT IS THE RESULT OF CHANGES IN THE BLOOD-VESSELS and rupture of one of them either in the choroid or ciliary body, or possibly in the retina.

2. Vision impaired according to the amount of hemorrhage.

3. Ophthalmoscope usually shows some red reflex, and floating about in the vitreous may be seen a dark or black mass of irregular form and varying density in its different parts.

   Not infrequently permanent floating opacities remain as a result of these hemorrhages.

4. Vision usually decidedly impaired on account of changes in the vitreous.

May be confounded with GLIOMA.

Pseudo-Glioma.	**Glioma.**
(Exudation, or, circumscribed suppuration in the vitreous).	
1. Pain none.	1. Pain none.
2. USUALLY OVER TEN YEARS OLD.	2. ALWAYS UNDER TEN YEARS OLD.
3. PREVIOUS HISTORY OF A LOW-GRADE INFLAMMATION OF THE EYE IN THE EARLIER STAGES.	3. NO HISTORY OF ANY INFLAMMATORY TROUBLE IN EARLY STAGES.
4. Cornea clear.	4. Cornea clear.
5. PUPIL OFTEN BULGING WHILE THE PERIPHERY OF IRIS IS RETRACTED.	5. PUPIL OFTEN DILATED AND THE ANT. CHAMBER SHALLOW.
6. Post. synechiæ may be absent.	6. No post. synechiæ.
7. TENSION DIMINISHED.	7. TENSION INCREASED, or normal.
8. Oblique light or ophthalmoscope will show a dirty yellow or white mass back of pupil.	8. Oblique light or ophthalmoscope will show a yellow-white or reddish-yellow mass behind the pupil.
9. The media MAY be clear.	9. Media clear.
10. THE MASS MAY MOVE OR CHANGE ITS POSITION A LITTLE AS EYE IS ROTATED.	10. TUMOR DOES NOT CHANGE ITS POSITION AS EYE IS ROTATED.
11. Possibly, blood-vessels may be seen on the mass.	11. Blood-vessels are always seen on the mass.
12. PREVIOUS HISTORY OF INJURY OR DISEASE AFFECTING THE HEAD.	12. NO PREVIOUS HISTORY.
Treatment.	
Hg. bi. chl.	
Pot. iod.	

May be confounded with GLIOMA, EXUDATION OF RETINITIS, MEMBRANOUS OPACITIES OF THE VITREOUS, RIPE SENILE CATARACT, SARCOMA OF CHOROID.

Detached Retina.	**Exudation of Retinitis.**
1. Vision impaired or lost in one section or area of the visual field *(scotoma)*. Objects may appear distorted *(metamorphopsia)*.	1. Vision impaired in certain areas of the visual field.
2. Pain none.	2. Pain none.
3. External appearance of eye normal.	3. External appearance of eye normal.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
4. Optic nerve well defined.	4. Optic nerve may be well defined.
5. Bluish-white UNDULATING MASS WITH FINE BLOOD-VESSELS CROSSING OVER IT; THESE blood-vessels CANNOT BE TRACED DIRECTLY TO THE DISC without change of glass in the ophthalmoscope.	5. Yellow-white STATIONARY MASS, WITH NORMAL-SIZED BLOOD-VESSELS RUNNING INTO OR UNDER IT, THESE blood-vessels CAN BE FOLLOWED DIRECTLY TO THE DISC without trouble or change of glass.
6. Veins in healthy retina normal size.	6. Veins MAY be full.
7. DETACHMENT USUALLY BELOW AND NOT INCLUDING THE MACULA.	7. USUALLY MORE THAN ONE PATCH AND IN REGION OF THE MACULA.
8. Floating opacities frequently seen in the vitreous.	8. Floating opacities not frequently seen in the vitreous.
9. When looking in certain directions, patient often complains of something "WAVING BEFORE THE EYE."	9. NO WAVY MOTION COMPLAINED OF.
10. APPEARS SUDDENLY.	10. APPEARS SUDDENLY IN MOST CASES.
11. Seen by using a strong convex or weaker concave glass than would be used to see the remainder of the fundus.	11. Seen with the same glass as the remainder of the fundus.

Detached Retina.

1. Vision impaired or lost in one section or area of the visual field *(scotoma)*.
2. Pain none.
3. External appearance of eye normal.

OPHTHALMOSCOPIC APPEARANCES:

4. A BLUISH WHITE UNDULATING MASS WITH THREAD-LIKE BLOOD VESSELS CROSSING OVER IT; these cannot be traced directly to the disc, without change of glass in the ophthalmoscope.
5. WHEN THE EYE IS AT REST THE DETACHED PORTION DOES NOT MOVE UNLESS THE DETACHMENT IS LARGE.
6. Small floating opacities are usually seen in the vitreous.
7. MYOPIA WITH CHOROIDITIS IN A MAJORITY OF THE CASES.
8. A PORTION OF FUNDUS USUALLY SEEN DISTINCTLY.
9. Vision about the same at all times.
10. Appears suddenly.

Treatment.

Recumbent position in bed.

Hypodermic injection of pilocarpine.

Operation to remove sub-retinal fluid.

Membranous Opacity in Vitreous.

1. Vision greatly impaired.
2. Pain none.
3. External appearance of eye normal.

OPHTHALMOSCOPIC APPEARANCES:

4. A LARGE DARK GRAY, OR LIGHT GRAY MASS FLOATING (sometimes almost stationary) IN THE VITREOUS. BLOOD-VESSELS MAY BE SEEN ON IT.
5. MEMBEANE MOVES AFTER THE EYEBALL IS FIXED OR AT REST, AND SEEMS TO FLOAT BACK INTO ITS ORIGINAL POSITION.
6. Small floating opacities are usually seen in the vitreous.
7. USUALLY SOME OF THE CHANGES OF CHOROIDITIS CAN BE OBSERVED.
8. NO PORTION OF THE FUNDUS SEEN DISTINCTLY ON ACCOUNT OF HAZY VITREOUS.
9. Vision may be fairly good for a moment, then THE APPEARANCE OF A CLOUD OR CURTAIN DROPPING BEFORE THE EYE.
10. Appears gradually.

Complete Detachment of Retina.	Ripe Senile Cataract.
1. VISION NIL, WITH HISTORY OF SUDDEN AND RAPID FAILURE OF SIGHT.	1. VISION GRADUALLY FAILING UNTIL ONLY LARGE OBJECTS OR LIGHT CAN BE SEEN.
2. Pain none.	2. Pain none.
By oblique light:	By oblique light:
3. OPACITY DEEP BEHIND IRIS, AND BACK FROM PUPIL.	3. OPACITY CLOSE TO IRIS, AND IN THE PUPIL.
4. Color: dull yellow-white.	4. Color: gray, gray-white, bluish-white, and very rarely dark brown.
5. A LIGHT HELD IN ANY PART OF THE FIELD IS NOT SEEN.	5. A LIGHT HELD IN ANY PART OF THE FIELD IS LOCATED READILY.
6. Not infrequently the tension (T) is — (soft eyeball).	6. Tension normal.

NEURO-RETINITIS (Neuritis Descendens).

May be confounded with PAPILLITIS.

Neuro-Retinitis.	Papillitis.
1. Vision varies from normal, to almost or complete blindness, and usually depends on exudation or hemorrhage in the retina.	1. Vision may be unimpaired even with disc swollen to the extent of three or four D.
2. External appearance of eye normal.	2. External appearance of eye normal.
3. Pain none.	3. Pain none.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
4. OPTIC DISC MORE PINK OR RED THAN NORMAL. USUALLY SWOLLEN, AND NOT INFREQUENTLY ITS OUTLINE IS BLURRED OR EVEN OBLITERATED.	4. OPTIC DISC SWOLLEN, ITS OUTLINE ILL-DEFINED OR LOST. In some cases swelling of the disc may measure four or six dioptries or even more, and be marked by patches or streaks of gray exudation and small hemorrhages *(choked disc)*. The exudation and hemorrhage may be very copious and extend even beyond the original limits of the disc.

(Continued on p. 45.)

RETINA MAY SHOW MARKED HYPERÆMIA WITH SLIGHT ŒDEMA, OR, LARGE YELLOW-WHITE PATCHES WITH ILL-DEFINED EDGES, SMALL WHITE OR GLISTENING WHITE SPOTS OR DOTS OF EXUDATION,—all, or any of these, with small or large hemorrhages in any portion of the fundus, or on the disc.

5. RETINA NORMAL EXCEPT IN THE IMMEDIATE VICINITY OF THE DISC.

6. ARTERIES MAY BE SMALL.

7. VEINS USUALLY FULL AND TORTUOUS.

8. Both eyes affected in the great majority of cases.

USUALLY ASSOCIATED WITH RENAL DISEASE (albuminuria, diabetes), LEAD POISONING, HIGH AND CONTINUED FEVER, SYPHILITIC MENINGITIS, CEREBRO-SPINAL MENINGITIS, ETC.

Treatment.

Treat the cause.

6. ARTERIES ALWAYS SMALL.

7. VEINS ALWAYS FULL AND TORTUOUS.

8. Not infrequently only one eye affected.

9. It is USUALLY THE RESULT OF INTRA-CRANIAL DISEASE, AS TUMORS, all varieties, but most frequently syphilitic, INJURIES TO THE HEAD, FRACTURE OR ABSCESS following, AND MENINGITIS.

If the papillitis is monocular, it is usual to look for the trouble below the optic chiasm, and not infrequently paralysis of the third nerve or some of its branches, or of the third and fourth nerves, will assist in locating the trouble: if due to a tumor of the cerebrum it will usually be located on the opposite side from the papillitis; and if due to abscess on the same side.

Treatment.

Treat the cause.

[illegible] NEURO-RETINITIS.

[illegible] DISSEMINATED CHOROIDITIS, CENTRAL CHOROIDITIS, [illegible] NERVE-FIBRES, DETACHED RETINA, [illegible] RETINA, HEMORRHAGIC GLAUCOMA, [illegible] NEURO-RETINITIS.

Albuminuric Neuro-Retinitis.	Disseminated Choroiditis.
[illegible]	1. Vision may or may not be impaired.
[illegible]	2. Field normal.
[illegible]	3. Pain none.
[illegible]	4. External appearance of eye normal.
[illegible]	OPHTHALMOSCOPIC APPEARANCES:
[illegible]	5. OPTIC NERVE NORMAL.
[illegible]	
6. Veins full and tortuous if the nerve is swollen.	6. Veins normal.
7. ARTERIES NORMAL SIZE AND RUN THROUGH OR UNDER PATCHES OF EXUDATION.	7. ARTERIES NORMAL SIZE AND RUN OVER PATCHES OF EXUDATION, OR ATROPHY.
8. In early stages the RETINA IS OFTEN HAZY IN THE REGION OF THE MACULA; the granular appearance is lost in many cases.	8. In early stages the RETINA IS APPARENTLY NORMAL EXCEPT OVER THE PATCHES.
9. EXUDATION, if in large patches, is usually DULL WHITE and distributed irregularly about, but most on temporal side of the fundus.	9. EXUDATION in large patches, YELLOW, OR YELLOW-WHITE COLOR, and distributed in any part of fundus, but MOST RARE IN REGION OF THE MACULA.
EXUDATION, IF IN DOTS OR MINUTE PATCHES, ASSUMES A STELLATE FORM ROUND THE [illegible]A; THEY ARE USUALLY [illegible]NG WHITE.	

(Continued on p. 4[illegible])

10. IN LATER STAGES DULL WHITE OR GLISTENING WHITE PATCHES are seen in the retina; EDGES of the larger patches are NOT CLEARLY DEFINED.

11. NO BLACK PIGMENT IN OR AROUND EDGE OF PATCHES.

12. SMALL HEMORRHAGES MAY BE SEEN IN THE FUNDUS.

13. Vitreous normal.

14. Both eyes affected.

15. ALBUMIN IN URINE.

Treatment.

Rest.
Blue glasses.
Constitutional treatment.

10. IN LATER STAGES DISTINCT WHITE OR GLISTENING WHITE PATCHES WITH CLEARLY DEFINED EDGES are seen.

11. BLACK PIGMEMT IN AND AROUND EDGE OF PATCHES.

12. NO HEMORRHAGES IN THE FUNDUS.

13. Vitreous hazy, with floating opacities in some cases.

14. Not infrequently only one eye affected.

15. NO ALBUMIN IN URINE.

Albuminuric Retinitis.	Opaque Nerve-Fibres.
1. VISION USUALLY IMPAIRED.	1. VISION NOT IMPAIRED.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
2. Optic nerve usually more pink or red than normal, and its outlines not well defined on any side.	2. Optic nerve never red or congested, and that portion not covered by opaque nerve-fibres is well defined.
3. Veins may be full and tortuous.	3. Veins normal.
4. Arteries normal.	4. Arteries normal.
5. RETINA OFTEN HAZY IN THE REGION OF THE MACULA.	5. RETINA NORMAL IN REGION OF THE MACULA.
6. WHITE OR GLISTENING WHITE PATCHES DISTRIBUTED IN THE FUNDUS, MOST FREQUENTLY SEEN IN THE REGION OF THE MACULA.	6. WHITE PATCHES, ONE OR MORE, EXTENDING FROM THE OPTIC NERVE INTO THE RETINA.
7. PINK RETINA SEEN BETWEEN THE PATCHES AND DISC.	7. NO PINK RETINA BETWEEN PATCHES AND DISC.
8. Exudation may cover blood-vessels where they pass under or through it.	8. Opaque nerve-fibres cover some blood-vessels after they pass over edge of disc; farther on vessels emerge into normal retina.
9. HEMORRHAGES IN RETINA NOT INFREQUENT.	9. NO HEMORRHAGE IN RETINA.
10. Blind spot of normal size.	10. Blind spot usually enlarged.

May be confounded with ALBUMINURIC RETINITIS, LEUCOCYTHEMIC RETINITIS, SYPHILITIC RETINITIS.

Diabetic Retinitis.

1. OPHTHALMOSCOPIC APPEARANCES THE SAME AS IN ALBUMINURIC RETINITIS.
2. SUGAR IN URINE.
3. RETINAL HEMORRHAGES MAY BE SEEN.

Treatment.

Treat the general condition.

Albuminuric Retinitis.

1. OPHTHALMOSCOPIC APPEARANCES THE SAME AS IN DIABETIC RETINITIS.
2. ALBUMIN AND CASTS IN URINE.
3. RETINAL HEMORRHAGES ARE FREQUENTLY SEEN.

Treatment.

Treat the general condition.

Leucocythemic Retinitis.

1. OPHTHALMOSCOPIC APPEARANCES ARE QUITE SIMILAR TO ALBUMINURIC RETINITIS.
2. FUNDUS PALE.
3. HISTORY OF LEUCOCYTHEMIA.

Treatment.

Treat the general condition.

Syphilitic Retinitis.

1. ASSOCIATED WITH SYPHILITIC CHOROIDITIS.
2. PREVIOUS HISTORY OF IRITIS, ETC.
3. GENERAL SYPHILITIC HISTORY.

Treatment.

Treat the general condition.

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May be confounded with DISSEMINATED CHOROIDITIS.

Pigmented Retinitis.	**Disseminated Choroiditis.**
1. Sight impaired, except in direct line of vision.	1. Sight usually a little impaired.
2. FIELD CONTRACTED ON ALL SIDES.	2. FIELD NOT CONTRACTED.
3. UNUSUAL IMPAIRMENT OF VISION IN TWILIGHT *(hemeralopia)*.	3. VISION NOT SPECIALLY IMPAIRED IN TWILIGHT.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
4. Blood-vessels normal in the early stages.	4. Blood-vessels normal.
5. Pigment in the retina, which shows as SMALL BLACK PATCHES WITH LARGE IRREGULAR PROCESSES; near the periphery where they are most numerous, the processes may unite and form an imperfect network.	5. SOME PATCHES ARE COMPOSED ENTIRELY OF BLACK PIGMENT, WHILE OTHERS SHOW A YELLOW-WHITE (exudation), OR GLISTENING WHITE SURFACE *(atrophy of the choroid)*, WITH PIGMENT IN AND AROUND THE EDGES.
6. Later stages: VISION IMPAIRED, APPARENTLY OUT OF ALL PROPORTION TO THE LESIONS SEEN IN THE FUNDUS.	6. Later stages: VISION OFTEN SURPRISINGLY GOOD WHEN THE LESION OF FUNDUS IS CONSIDERED.
7. Last stage: atrophy of optic nerve with small blood-vessels.	7. No atrophy of optic nerve; blood-vessels of normal size.
8. Both eyes affected.	8. Often one eye affected much more than its fellow.
9. Hereditary in many or most cases.	9. Not hereditary.

Treatment.

Not satisfactory.

Strychnia has been advised.

May be confounded with ALBUMINURIC RETINITIS.

Embolism of the Cent. Artery of Retina.	**Albuminuric Retinitis.**
1. SUDDEN AND USUALLY COMPLETE BLINDNESS.	1. VISION USUALLY IMPAIRED.
2. Pain none.	2. Pain none.
3. External appearance of eye normal.	3. External appearance of eye normal.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
4. Disc well defined but pale, and in later stages white *(atrophy)*.	4. Disc pink, and its outline may be blurred.
5. ARTERIES VERY SMALL.	5. ARTERIES NORMAL SIZE.
6. Veins normal, or partly empty.	6. Veins full, and tortuous in some cases.
7. A BRIGHT RED SPOT OCCUPIES THE POSITION OF THE MACULA, WHILE THE RETINA AROUND THIS HAS A DIFFUSE MILKY-WHITE APPEARANCE; the remaining retina being pale.	7. RETINA HAZY IN THE REGION OF THE MACULA; THE GRANULAR APPEARANCE IS LOST IN MANY CASES; IN OTHER CASES DISTINCT DOTS OR SPOTS OF EXUDATION PARTIALLY SURROUND THE MACULA. SMALL FLAME-SHAPED HEMORRHAGES MAY BE PRESENT IN SOME PORTION OF THE FUNDUS.
8. NO ALBUMIN in the urine.	8. ALBUMIN OR CASTS may be found in the urine.

Treatment.

Massage of eyeball has been recommended if case is seen early.

May be confounded with NEURO-RETINITIS, HYPERMETROPIA.

Optic Neuritis.

1. Vision may remain perfect.

2. External appearance of eye normal.

OPHTHALMOSCOPIC APPEARANCES:

3. A pink, a blurred ill-defined, or a swelled disc, marked by PATCHES OF EXUDATION, and NOT INFREQUENTLY SMALL HEMORRHAGES WHICH GIVE THE WHOLE DISC A REDDISH-GRAY APPEARANCE *(choked disc)*.

4. ARTERIES SMALL OR NORMAL SIZE.
5. VEINS FULL AND TORTUOUS.

To determine the amount of swelling of the disc, find the strongest convex glass or the weakest concave glass that the fundus can be seen with distinctly, then in the same manner determine the best glass to see the centre of the disc, the difference will be the amount of swelling in dioptries.

If a marked papillitis abates, the outlines of the disc will be seen at first indistinctly *(woolly disc)*, and later the outlines become distinct and the disc of normal color, or the outlines may become unusually distinct, and the whole disc white or gray *(atrophy)*.

Hypermetropia with a slightly elevated disc (congenital), and an abnormal amount of Connective Tissue in and around the Disc.

1. Vision may be perfect with or without the aid of glasses.
2. External appearance of eye normal.

OPHTHALMOSCOPIC APPEARANCES:

3. A slightly elevated dark pink, or dark red blurred disc, WITH WHITE LINES (connective tissue), WHICH ARE SEEN IN AND AROUND THE DISC, BUT MOST DISTINCTLY BY THE SIDE OF BLOOD-VESSELS, and which MAY disappear in certain lights.

4. ARTERIES NORMAL SIZE.
5. VEINS NORMAL.

Disc and fundus may be seen with the same glass.

May be confounded with CHRONIC GLAUCOMA, TOBACCO AMBLYOPIA, PHYSIOLOGICAL CUPPING, ALCOHOL AMBLYOPIA.

Optic-Nerve Atrophy.	**Chronic Glaucoma.**
1. Vision impaired or lost.	1. Vision impaired or lost.
2. CONCENTRIC CONTRACTION OF THE VISUAL FIELD, especially for colors green and red.	2. VISUAL FIELD AND COLOR ZONES CONTRACTED MORE ON NASAL THAN TEMPORAL SIDE.
3. COLORED RINGS OR HALO NEVER SEEN AROUND ARTIFICIAL LIGHTS.	3. COLORED RINGS OR HALO MAY BE SEEN AROUND ARTIFICIAL LIGHTS.
4. Pain none.	4. Pain little or none.
5. External appearance of eye normal.	5. Circum-corneal vessels may be enlarged.
6. PUPIL MAY NOT REACT TO LIGHT STIMULUS, AND WILL YET CONTRACT ON ACCOMMODATION *(Argyll-Robertson pupil).*	6. PUPIL DILATED MORE OR LESS according as disease is advanced; it may or may not react to light stimulus.
7. ANTERIOR CHAMBER NORMAL.	7. ANTERIOR CHAMBER USUALLY SHALLOW.
8. TENSION NORMAL.	8. TENSION INCREASED.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
9. WHOLE DISC CONCAVE (saucer-shape). See page 72.	9. WHOLE DISC EXCAVATED (cup-shape). See page 72.
10. Color white, or mottled gray.	10. Color white, bluish-white, or gray.
11. BLOOD-VESSELS PASS FROM RETINA INTO THE DISC WITHOUT MAKING A SHARP BEND OR CURVE; THEY ARE USUALLY SMALL AND STRAIGHT.	11. ALL BLOOD-VESSELS BEND SHARPLY OVER THE EDGE OF THE DISC; they may be seen indistinctly at the bottom of the cup, and can be brought into view by using a weaker convex or stronger concave glass.
12. ANY AGE.	12. USUALLY OVER 40.
Treatment. Strychnia or Anti-syphilitic.	

May be confounded with ALBUMINURIC RETINITIS, CHOROIDITIS, POST. STAPHYLOMA.

Opaque Nerve Fibres.	**Choroiditis.**
1. Vision normal.	1. Vision usually impaired.
2. Pain none.	2. Pain none.
3. External appearance of eye normal.	3. External appearance of eye normal.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
4. ARTERIES and veins normal, and not infrequently when leaving the disc they PASS UNDER A PORTION OF THE WHITE PATCH of opaque nerve fibres.	4. ARTERIES and veins normal, and they PASS OVER THE WHITE OR YELLOW PATCHES.
5. Irregular milky white or glistening white PATCHES, EXTENDING INTO THE RETINA FROM THE OPTIC DISC AND CONTINUOUS WITH IT.	5. Yellow or shining white PATCHES IN ANY PORTION OF THE FUNDUS AND SEPARATED FROM THE DISC BY NORMAL PINK RETINA.
6. NO PIGMENT DEPOSIT ON EDGE OF PATCHES.	6. BLACK PIGMENT DEPOSITS ON EDGE OF PATCHES.
7. Vitreous clear.	7. Vitreous usually hazy with some floating opacities.
8. "Blind spot" usually enlarged.	8. "Blind spot" of normal size.
Treatment. None.	

May be confounded with DETACHED RETINA, SARCOMA OF CHOROID, PSEUDO-GLIOMA.

Glioma.	Detached Retina.
1. ALWAYS UNDER 10 YEARS OF AGE.	1. RARE BEFORE ADULT LIFE.
2. If glioma is large the anterior chamber will be shallow and the pupil dilated, with almost or complete loss of red reflex.	2. If retina is completely detached there will be complete loss of red reflex.
3. TENSION will be INCREASED.	3. TENSION usually DIMINISHED.
By oblique light :	By oblique light.
4. A DIRTY YELLOW-GRAY OR REDDISH-GRAY MASS (depends on vascularity) back of the pupil.	4. A DULL YELLOW-WHITE MASS back of the pupil.
5. Painful in later stages.	5. No pain.
6. If glioma is recent and small (rarely seen) ophthalmoscope shows a yellow-white, stationary tumor, usually near the disc.	6. If detachment is recent and small ophthalmoscope shows a bluish-white mass, usually near the periphery.
7. Usually small BLOOD-VESSELS ANASTOMOSE FREELY OVER THE TUMOR (they may be absent).	7. THREAD-LIKE BLOOD-VESSELS CROSS THE DETACHED RETINA.

Treatment.

Enucleation of eyeball.

Glioma of Retina.	Sarcoma of Choroid.
1. ALWAYS IN INFANCY OR EARLY CHILDHOOD.	1. ADULT LIFE.
2. RETINA INVOLVED IN EARLIEST STAGES.	2. RETINA NOT INVOLVED IN EARLIEST STAGES.

May be confounded with ALBUMINURIC RETINITIS.

Central Choroiditis.	**Albuminuric Retinitis.**
1. Vision impaired (perhaps for years).	1. Vision impaired (recent).
2. Pain none.	2. Pain none.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
3. DISC NORMAL WITH WELL-DEFINED EDGE.	3. DISC USUALLY MORE PINK OR RED THAN NORMAL AND ITS OUTLINE NOT WELL DEFINED.
4. ARTERIES NORMAL SIZE AND RUN OVER THE PATCHES.	4. ARTERIES NORMAL SIZE AND RUN THROUGH OR UNDER THE PATCHES.
5. VEINS NORMAL SIZE.	5. VEINS MORE OR LESS FULL AND TORTUOUS WHEN DISC IS NOT WELL DEFINED.
6. EXUDATION appears as a large, irregular, YELLOW, OR YELLOW-WHITE PATCH, WITH ILL-DEFINED EDGES, AND OCCASIONALLY PIGMENT IN OR AROUND IT.	6. EXUDATION appears as a DULL-WHITE OR WHITE PATCH WITH ILL-DEFINED EDGES AND NO PIGMENT.
7. WHITE PATCHES WITH WELL-DEFINED EDGES, AND PIGMENT IN OR AROUND THEM, DENOTE *atrophy of the choroid* AND EXPOSURE OF THE SCLEROTIC.	7. WHITE PATCHES ARE SMALL, USUALLY GLISTENING, AND MOST ABUNDANT IN REGION OF THE MACULA. No pigment in or around them.
8. FLOATING OPACITIES IN THE VITREOUS.	8. NO FLOATING OPACITIES IN THE VITREOUS.
9. NO HEMORRHAGE SEEN IN THE FUNDUS.	9. HEMORRHAGES FREQUENTLY SEEN IN THE FUNDUS.
10. NO ALBUMIN IN URINE.	10. ALBUMIN AND CASTS IN URINE.

Treatment.

Rest.

Atropine.

Colored glasses.

Constitutional treatment.

May be confounded with ALBUMINURIC RETINITIS, PIGMENTARY RETINITIS, TUBERCLE OF THE CHOROID.

Disseminated Choroiditis.	**Tubercle of the Choroid.**
1. NOT UNCOMMON.	1. VERY RARE.
2. Vision may not be impaired.	2. Vision not impaired.
3. Pain none.	3. Pain none.
4. External appearance of eye normal.	4. External appearance of eye normal.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
5. ARTERIES AND VEINS NORMAL AND RUN OVER THE PATCHES.	5. ARTERIES AND VEINS NORMAL.
6. Exudation in circumscribed yellow, or yellow-white patches, with ill-defined edges, and of irregular size and shape. There may be one or many patches. AS THE EXUDATION DISAPPEARS THE ATROPHIED CHOROID ALLOWS THE GLISTENING SCLEROTIC TO BE SEEN; CHOROIDAL PIGMENT USUALLY ADHERES TO THE EDGES.	6. Distinct, small, yellow-white oval bodies, which are slightly elevated. The number is usually small. May be confined to one large mass in region of the disc or macula. A majority of the cases are seen in children.
7. SIZE OF PATCHES 3 MM. OR MORE.	7. SIZE OF TUBERCLE 3 MM. OR LESS.
8. Small opacities in vitreous are not infrequent.	8. No opacities in the vitreous.
9. No tubercle.	9. Tubercle of lungs or meninges.
Treatment. Rest. Colored glasses. Mixed treatment.	

May be confounded with DISSEMINATED CHOROIDITIS, ALBUMINURIC RETINITIS.

Tubercle of the Choroid.	**Albuminuric Retinitis.**
1. RARE.	1. NOT INFREQUENT.
2. Vision not impaired.	2. Vision usually impaired.
3. Pain none.	3. Pain none.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
4. Disc normal.	4. Disc more pink or red than normal, and often its outline is blurred.
5. ARTERIES normal; and are NEVER COVERED BY TUBERCLE.	5. ARTERIES normal and RUN THROUGH PATCHES OF EXUDATION.
6. RETINA NOT HAZY.	6. RETINA OFTEN HAZY IN REGION OF THE MACULA.
7. Small, elevated, yellow-white bodies in retina.	7. Large yellow-white, or small glistening white patches in the retina; not elevated.
8. FORM REGULAR, AND CIRCULAR, OR OVAL.	8. FORM IRREGULAR.
9. SIZE, 3 MM. OR LESS IN DIAM.	9. SIZE, ALWAYS SOME PATCHES MORE THAN 3 MM. IN DIAM.
10. DISTRIBUTED AS SINGLE POINTS IN THE FUNDUS.	10. SMALL PATCHES OR DOTS USUALLY GROUPED IN A STELLATE FORM ROUND THE MACULA.
11. No hemorrhage in fundus.	11. Hemorrhage frequent in fundus.
12. TUBERCLE OF LUNGS OR MENINGES.	12. NO TUBERCLE OF LUNGS OR MENINGES.
13. NO ALBUMIN IN URINE.	13. ALBUMIN IN URINE.

Treatment.

Treat the general condition.

May be confounded with DETACHED RETINA, GLIOMA.

Sarcoma of the Choroid.	**Detached Retina.**
1. RARE.	1. COMMON.
2. Vision not usually impaired in the earliest stages.	2. Vision impaired in some portion of the field.
3. VISION IMPAIRED GRADUALLY.	3. VISION IMPAIRED SUDDENLY.
4. External appearance of eye normal.	4. External appearance of eye normal.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
5. CIRCUMSCRIBED OVAL OR ROUND ELEVATION UNDER THE RETINA.	5. AN IRREGULAR WAVY OR UNDULATING MASS.
6. Color dark gray, or decidedly pigmented.	6. Color bluish-white.
7. BLOOD-VESSELS OF IRREGULAR COURSE, RIBBON-LIKE APPEARANCE, AND DARK ORANGE COLOR (choroidal vessels), ANASTOMOSE FREELY OVER THE TUMOR.	7. BLOOD-VESSELS PASS ALMOST STRAIGHT ACROSS THE MASS AND ARE APPARENTLY VERY SMALL AS COMPARED WITH HEALTHY RETINAL VESSELS.
Later stages:	Later stages:
8. PAIN.	8. NO PAIN.
9. SWELLING OF CONJUNCTIVA AND LIDS.	9. LIDS DO NOT SWELL.
10. TENSION INCREASED.	10. TENSION DIMINISHED.
11. PUPIL DILATED.	11. PUPIL NORMAL.
12. ANT. CHAMBER SHALLOW.	12. ANT. CHAMBER NORMAL.
13. Retina completely detached.	13. Retina completely detached.

Treatment.

Enucleation.

(Retro-Bulbar Neuritis), (Amblyopia ex abusu).

May be confounded with OPTIC-NERVE ATROPHY, CHRONIC GLAUCOMA.

Alcohol or Tobacco Amblyopia.

1. Vision gradually impaired.
2. External appearance of eye normal.
3. VISUAL FIELD NOT USUALLY CONTRACTED TO ANY CONSIDERABLE EXTENT, BUT BY CAREFUL EXAMINATION WITH THE PERIMETER, SCOTOMATA FOR GREEN AND RED WILL BE FOUND *(field of retro-bulbar neuritis).*

OPHTHALMOSCOPIC APPEARANCES:

4. DISC NORMAL EXCEPT THE TEMPORAL THIRD, WHICH IS A LITTLE PALE, OR GRAY.
5. ARTERIES NORMAL SIZE.
6. RETINA NORMAL PINK COLOR.
7. EXCESS OF ALCOHOL OR TOBACCO, or usually both.

Amblyopia may be caused by:

a. Hysteria.
b. Quinine.
c. Salicylic acid.
d. Exposure to bright light.
e. Lightning stroke.
f. Glycosuria.

Treatment.

Remove the cause.
Strychnia.

Optic-Nerve Atrophy.

1. Vision gradually impaired.
2. External appearance of eye normal.
3. CONCENTRIC CONTRACTION OF THE VISUAL FIELD, ESPECIALLY FOR COLORS GREEN AND RED. NO SCOTOMATA.

OPHTHALMOSCOPIC APPEARANCES:

4. WHOLE DISC PALE OR WHITE, SOMETIMES GRAY, and usually a little excavated (saucer-shape); may be mottled.
5. ARTERIES SMALL.
6. RETINA PALE.
7. NO EXCESS OF ALCOHOL OR TOBACCO.

May be confounded with CHR. GLAUCOMA, ATROPHY OF THE OPTIC NERVE.

Physiological Cupping of Disc.

1. VISION NOT IMPAIRED.
2. VISUAL FIELD NORMAL.
3. Pain none.
4. External appearance of eye normal. OPHTHALMOSCOPIC APPEARANCES (see page 72).
5. Fundus normal color.

Treatment.

None.

Optic-Nerve Atrophy.

1. VISION IMPAIRED.
2. VISUAL FIELD CONTRACTED, ESPECIALLY FOR COLORS.
3. Pain none.
4. External appearance of eye normal. OPHTHALMOSCOPIC APPEARANCES (see page 72).
5. Fundus pale.

Megalopsia.

1. Objects appear to be too large.
2. Due to retinal changes which cannot be detected with the ophthalmoscope.

Treatment.

None.

Micropsia.

1. Objects appear to be too small.
2. Due to retinal changes which cannot be detected with the ophthalmoscope.

Treatment.

None.

Metamorphopsia.

1. Objects appear to be distorted.
2. Due to retinal changes, or astigmatism.

Treatment.

Correct any astigmatism. See detached retina.

Photopsia (Phosphenes).

1. Flashes of light or sparks before the eyes.
2. Due to retinal changes.

Treatment.

Treat the cause, it may be found in the retina, or choroid. Attention to the general health.

May be confounded with IRITIS, INTERSTITIAL KERATITIS, IRIDO-CYCLITIS.

Acute Glaucoma.	**Iritis.**
1. Vision failing rapidly, especially on the nasal side of field.	1. Vision impaired.
2. Pain severe, extending to temple and side of the head, often causing nausea.	2. Pain severe, extending to nose, brow, and temple.
3. SOME DREAD AND INTOLERANCE OF LIGHT *(photophobia)*.	3. MARKED PHOTOPHOBIA.
4. COLORED RINGS OR HALO ROUND ARTIFICIAL LIGHTS.	4. NO COLORED RINGS OR HALO ROUND ARTIFICIAL LIGHTS.
5. TENSION INCREASED TO A MARKED DEGREE (T. + 2).	5. TENSION MAY BE SLIGHTLY INCREASED (T. +).
6. Œdema of lids and conjunctiva.	6. Œdema of lids and conjunctiva.
7. Circum-corneal injection.	7. Circum-corneal injection.
8. Cornea loses some of its lustre, and there may be partial anæsthesia.	8. Cornea clear, with no anæsthesia, but appears to be hypersensitive.
9. ANTERIOR CHAMBER SHALLOW.	9. ANTERIOR CHAMBER NORMAL.
10. Aqueous turbid.	10. Aqueous "muddy."
11. PUPIL DILATED, SLUGGISH, AND OFTEN HAS A GREENISH HUE.	11. PUPIL CONTRACTED, AND SLUGGISH OR STATIONARY.
12. Iris somewhat discolored.	12. Iris discolored.
13. NO EXUDATION IN PUPIL.	13. EXUDATION IN PUPIL.
14. NO POSTERIOR SYNECHIÆ.	14. POSTERIOR SYNECHIÆ.
OPHTHALMOSCOPIC APPEARANCES (see page 72).	OPHTHALMOSCOPIC APPEARANCES:
15. Often impossible to see fundus.	15. Exudation usually obstructs a good view of fundus.
16. FIELD CONTRACTED ON NASAL SIDE, and occasionally above and below, while the temporal side may remain unaffected.	16. FIELD NOT CONTRACTED.
17. Age over 35.	17. Rare before puberty.

Treatment.

Salicylic acid. Cathartics.
Eserine gr. 1.– ℥ i. instilled into eye.
Iridectomy or sclerotomy.

Acute Glaucoma.	**Interstitial Keratitis.**
1. Vision on nasal side of field, failing or lost.	1. Vision impaired over most of the field.
2. Pain severe, extending to temple and side of the head.	2. Pain severe as cornea is involved; referred to eyeball.
3. Some dread and intolerance of light.	3. A dread and intolerance of light.
4. COLORED RINGS OR HALO ROUND ARTIFICIAL LIGHTS.	4. NO COLORED RINGS ROUND ARTIFICIAL LIGHTS.
5. TENSION INCREASED TO A MARKED DEGREE.	5. TENSION NORMAL.
6. Œdema of lids and conjunctiva.	6. No œdema of lids.
7. Circum-corneal injection.	7. Circum-corneal injection.
8. Cornea loses some of its lustre, and THERE MAY BE PARTIAL OR COMPLETE ANÆSTHESIA.	8. Cornea decidedly hazy and is HYPERSENSITIVE.
9. NO BLOOD-VESSELS ON CORNEA.	9. BLOOD-VESSELS MAY EXTEND TO CORNEA.
10. ANT. CHAMBER SHALLOW.	10. ANT. CHAMBER NORMAL.
11. PUPIL DILATED, SLUGGISH, AND OFTEN HAS A GREENISH HUE.	11. PUPIL NORMAL OR CONTRACTED.
12. Failure of accommodation.	12. Accommodation good.
13. Visual field contracted, especially on nasal side.	13. Visual field not contracted.
OPHTHALMOSCOPIC APPEARANCES (see page 72).	OPHTHALMOSCOPIC APPEARANCES:
14. Often impossible to see fundus.	14. Hazy cornea usually obstructs a good view of the fundus.
15. Rarely under 35.	15. Disease of youth.
16. NO HEREDITARY SYPHILIS.	16. HEREDITARY SYPHILIS.
17. TEETH REGULAR.	17. PEG OR NOTCHED TEETH.

May be confounded with ALBUMINURIC RETINITIS.

Hemorrhagic Glaucoma.	**Albuminuric Retinitis with Hemorrhages** (Retinitis Apoplectica).
1. Vision suddenly impaired or lost.	1. Vision suddenly impaired.
2. PAIN IS APPARENTLY SECONDARY TO LOSS OF VISION (T. + 2 — 3).	2. PAIN NONE.
3. TENSION INCREASES RAPIDLY AFTER FAILURE OF VISION.	3. TENSION NORMAL.
4. Cornea may appear dull and smoky.	4. CORNEA CLEAR.
5. ANTERIOR CHAMBER SHALLOW.	5. ANTERIOR CHAMBER NORMAL.
6. Aqueous may be turbid.	6. Aqueous clear.
7. PUPIL DILATED AND SLUGGISH.	7. PUPIL NORMAL.
8. Iris may be discolored.	8. Iris normal.
9. Ophthalmoscopic appearances (see page 72).	9. Ophthalmoscopic appearances (see page 46).
10. Hemorrhages may obstruct all clear view of the fundus.	10. Hemorrhages usually small and flame-shaped.
11. NO EXUDATION IN RETINA.	11. PATCHES OF EXUDATION IN RETINA.
12. Arteries may pulsate.	12. Arteries do not pulsate.
13. NO ALBUMIN IN URINE.	13. ALBUMIN IN URINE.
14. Rare under 40.	14. Any age.
15. One eye affected.	15. Both eyes affected.

Treatment.

Eserine (locally).
Cathartic, salicylic acid.
Sclerotomy.
Enucleation.

May be confounded with CONJUNCTIVITIS.

Sub-Acute Glaucoma.	**Conjunctivitis.**
1. Vision impaired on nasal side of visual field.	1. Vision not impaired except by mucus on the cornea.
2. Pain in eyeball and temple.	2. Itching or burning pain in the lids.
3. COLORED RINGS OR HALO ROUND ARTIFICIAL LIGHTS.	3. NO COLORED RINGS ROUND ARTIFICIAL LIGHTS.
4. DISCHARGE WATERY.	4. DISCHARGE STICKY OR PURULENT.
5. Circum-corneal injection.	5. Whole conjunctiva congested.
6. Cornea may appear dull and smoky.	6. Cornea clear.
7. ANTERIOR CHAMBER SHALLOW.	7. ANT. CHAMBER NORMAL.
8. Aqueous may be turbid.	8. Aqueous clear.
9. PUPIL DILATED.	9. PUPIL NORMAL.
10. TENSION INCREASED.	10. TENSION NORMAL.
11. Ophthalmoscopic appearances (see page 72).	11. Ophthalmoscopic appearances normal.
12. RARE UNDER 40.	12. ANY AGE.
13. ONE EYE AFFECTED.	13. USUALLY BOTH EYES AFFECTED.

Treatment.

Salicylic acid internally.
Eserine instilled q. 4. h.
Iridectomy if tension increases.

May be confounded with PHYSIOLOGICAL CUPPING OF THE DISC, OPTIC NERVE ATROPHY, TOBACCO AMBLYOPIA, POSTERIOR STAPHYLOMA.

Chronic Glaucoma.	**Physiological Cupping of Optic Disc.**
1. Vision impaired, or lost *(absolute glaucoma).*	1. Vision not impaired.
2. VISUAL FIELD CONTRACTED, especially on nasal side. Central vision may remain fairly good.	2. VISUAL FIELD NORMAL.
3. Pain may be little or none.	3. Pain none.
4. COLORED RINGS ROUND ARTIFICIAL LIGHTS.	4. NO COLORED RINGS ROUND ARTIFICIAL LIGHTS.
5. FAILURE OF ACCOMMODATION.	5. NO FAILURE OF ACCOMMODATION.
6. TENSION INCREASED.	6. TENSION NORMAL.
7. Circum-corneal vessels may be injected.	7. External appearance of eye normal.
8. Cornea clear.	8. Cornea clear.
9. ANTERIOR CHAMBER SHALLOW.	9. ANTERIOR CHAMBER NORMAL.
10. Aqueous clear.	10. Aqueous clear.
11. PUPIL MAY BE NORMAL, BUT IT IS USUALLY A LITTLE DILATED AND SLUGGISH.	11. PUPIL NORMAL.
OPHTHALMOSCOPIC APPEARANCES (see page 72):	OPHTHALMOSCOPIC APPEARANCES (see page 72).
12. Rarely under 40.	12. Any age.

Treatment.

Salicylic acid internally.
Eserine instilled q. 4. h.
Iridectomy if tension increases.

Chronic Glaucoma.	**Alcohol or Tobacco Amblyopia.**
1. Vision impaired.	1. Vision impaired.
2. VISUAL FIELD CONTRACTED ON NASAL SIDE, SOMETIMES ABOVE AND BELOW, WHILE THE TEMPORAL FIELD MAY REMAIN QUITE GOOD.	2. VISUAL FIELD NOT CONTRACTED, BUT SCOTOMATA FOR COLORS WILL USUALLY BE FOUND.
3. Pain may be little or none.	3. Pain none.
4. COLORED RINGS OR HALO ROUND ARTIFICIAL LIGHTS.	4. NO COLORED RINGS OR HALO ROUND ARTIFICIAL LIGHTS.
5. Failure of accommodation.	5. Failure of accommodation.
6. TENSION INCREASED.	6. TENSION NORMAL.
7. Circum-corneal vessels may be enlarged.	7. External appearance of eye normal.
8. Cornea clear.	8. Cornea clear.
9. ANTERIOR CHAMBER SHALLOW.	9. ANTERIOR CHAMBER NORMAL.
10. Aqueous clear.	10. Aqueous clear.
11. PUPIL may be normal, but it is USUALLY A LITTLE DILATED AND SLUGGISH.	11. PUPIL NORMAL, OR CONTRACTED.
OPHTHALMOSCOPIC APPEARANCES (see page 72).	OPHTHALMOSCOPIC APPEARANCES (see page 60).
12. Rare under 40.	12. Adult and middle age.
13. NO EXCESS OF ALCOHOL OR TOBACCO.	13. EXCESS OF ALCOHOL OR TOBACCO OR BOTH.

[illegible]

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible] see page 71.
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible] increased.
[illegible]	[illegible] may be [illegible]
[illegible]	Anterior chamber shallow.
[illegible]	Pupil may be normal but it is usually a little dilated and sluggish.
Ophthalmoscopic appearances see pages [illegible]	Ophthalmoscopic appearances see page 72.
[illegible]	10. Hypermetropia is present in two thirds of the cases.
11. Usually young adults.	11. Rare under 40.

Treatment.

None.

Posterior Staphyloma.	**Opaque Nerve-Fibres.**
1. Vision usually impaired as a result of myopia, or choroiditis, or both.	1. Vision normal.
2. Pain none.	2. Pain none.
3. External appearance of eye normal.	3. External appearance of eye normal.
OPHTHALMOSCOPIC APPEARANCES:	OPHTHALMOSCOPIC APPEARANCES:
4. A LARGE GLISTENING WHITE PATCH ON TEMPORAL SIDE OF DISC and continuous with it, although the outline of the disc can usually be seen. Not infrequently the staphyloma is several times as large as the disc, and almost surrounds it.	4. IRREGULAR MILKY OR GLISTENING WHITE PATCHES extending into the retina from the optic disc, and continuous with it. NO BLACK PIGMENT DEPOSITS ARE SEEN IN OR AROUND THESE PATCHES.
UNABSORBED BLACK PIGMENT MAY STILL BE SEEN IN THE STAPHYLOMA, OR CLINGING TO ITS EDGES.	
5. The larger blood-vessels appear to be driven in under the nasal side of the disc. SMALL AND STRAIGHT BLOOD-VESSELS PASS OUT AND OVER THE SHINING WHITE PATCH, to the temporal side of retina.	5. BLOOD-VESSELS normal, and not infrequently WHEN LEAVING THE DISC PASS UNDER A PORTION OF THE WHITE PATCH of opaque nerve-fibres.
6. MYOPIA AND CHOROIDITIS ARE ASSOCIATED IN THE GREAT MAJORITY OF CASES.	6. MYOPIA OR CHOROIDITIS ARE RARELY SEEN WITH OPAQUE NERVE-FIBRES.

Sympathetic Irritation or Inflammation.	Plastic Iritis.
1. Vision impaired.	1. Vision impaired.
2. Pain may or may not be present for the first few days.	2. Pain usually one of the first symptoms.
3. Bright light irritates the eye out of all proportion to the amount of pain.	3. Bright light irritates the eye.
4. Lachrymation may be the only symptom for several days.	4. Lachrymation due to light and pain.
5. Inability to do close work with comfort, tiresome *rather* than painful.	5. Close work not tiresome but painful.
6. Pupil may be contracted.	6. Pupil contracted.
7. No posterior synechiæ.	7. Posterior synechiæ.
8. Irritating eye tender (?) and may contain a foreign body, or have a wound of the ciliary region or an irritated iris.	8. No wound of the fellow eye.

Above symptoms may all disappear, showing *symp. irritation*, or the irritating eye may be enucleated, yet the case go on to total destruction, proving conclusively that it had been *symp. inflammation*.

(Continued on page 71.)

LATER STAGE, OR SYMPATHETIC INFLAMMATION.	
9. CIRCUM-CORNEAL INJECTION.	9. CIRCUM-CORNEAL INJECTION.
10. TENDERNESS ON PRESSURE OVER THE CILIARY REGION; MAY BE CONFINED TO ONE SMALL SPOT.	10. NO SPECIAL TENDERNESS OVER CILIARY REGION.
11. DOTS OF OPACITY ON ENDOTHELIAL LAYER OF CORNEA *(descemitis)*.	11. NO DOTS OF OPACITY ON ENDOTHELIAL LAYER OF CORNEA.
12. Pupil usually sluggish, with some posterior synechiæ.	12. Pupil contracted, sluggish, or stationary, with posterior synechiæ.
13. Iris may be discolored.	13. Iris discolored.
ULTIMATELY:	
14. Cornea hazy.	14. Cornea clear.
15. Aqueous turbid.	15. Aqueous turbid.
16. Iris infiltrated.	16. Iris infiltrated.
17. Vitreous filled with floating opacities.	17. Vitreous clear, if seen.
18. Retina and choroid involved.	18. Retina and choroid not involved.
19. Tension increased *(secondary glaucoma)*.	19. Tension may be a little increased.
20. Anterior chamber shallow, followed by fluid vitreous *(synchisis)*, diminished tension, and possibly phthisis bulbi.	20. Ant. chamber normal.

Treatment.

Enucleate the irritating eye.
Atropine cautiously.
Hot fomentations.
Colored glasses.
Mercurial inunctions.

Glaucoma.

WHOLE DISC EXCAVATED
(Cup-shape).

1. Color white, bluish-white, or gray.
2. ALL BLOOD-VESSELS BEND SHARPLY OVER THE EDGE OF THE DISC. They may be seen indistinctly at the bottom of the "cup," and can be brought into view by using a weaker convex (+) or stronger concave (−) glass.
3. ARTERIES OFTEN PULSATE.

Atrophy of Optic Disc.

WHOLE DISC CONCAVE
(Saucer-shape).

1. Color white or gray.
2. BLOOD-VESSELS PASS FROM RETINA INTO THE DISC WITHOUT MAKING A SHARP BEND OR CURVE. They are seen distinctly with the glass used to see the retina.
3. ARTERIES SMALL AND STRAIGHT. NEVER PULSATE.

Physiological Cupping.

DISC PARTIALLY EXCAVATED.
(Thimble-shape.)

1. CENTRE PORTION OF DISC EXCAVATED, and possibly the excavation may extend to the temporal edge.
2. COLOR OF DISC NORMAL, EXCEPT THE CENTRAL EXCAVATED PORTION, which is white or gray.
3. BLOOD-VESSELS BEND OVER THE EDGE OF THE EXCAVATION.

Myopic Crescent.

DISC PARTIALLY EXCAVATED.
(Ladle-shape.)

1. THE CHOROID ON THE TEMPORAL EDGE OF DISC IS ATROPHIED, EXPOSING THE SHINING WHITE SCLEROTIC.
   If the atrophy extends and loses its crescent shape it is called a *post. staphyloma.*
2. COLOR OF DISC NORMAL, EXCEPT ON TEMPORAL EDGE, which is shining white, and not infrequently pigmented.
3. THE LARGER BLOOD-VESSELS MAY APPEAR TO BE DRIVEN IN UNDER THE NASAL HALF OF THE DISC.

Foreign Bodies on Conjunctiva.

1. Painful.

Treatment.

Cocaine ; evert lids and remove.

Burns with lime, melted metals, etc., should be carefully washed, and all particles removed ; oil and atropine instilled.

Foreign Bodies on Cornea.

1. Very painful.

Treatment.

Cocaine ; remove with a sharp-pointed instrument without abrasion of corneal epithelium.

Foreign Bodies in Ant. Chamber and Iris.

1. Often painless.
2. Seen by oblique light.

Treatment.

Open ant. chamber and remove with magnet, or forceps ; or it may be advisable to remove that portion of the iris on which it rests *(iridectomy)*.

Foreign Bodies in Crystalline Lens.

1. Usually painless.
2. Rarely seen on account of the opacity of lens (traumatic cat.).

Treatment is determined by the amount of opacity and inflammation following. If lens should swell and be painful, extraction is indicated.

Foreign Bodies in the Vitreous.

1. A suppurative process of the vitreous follows, and is accompanied by a general inflammation of the whole eyeball *(panophthalmitis)*, which terminates when the eyeball is destroyed, the eye blind, and the globe atrophied *(phthisis bulbi)*.

Treatment.

Remove with magnet if possible.

Enucleation may be necessary to avoid sympathetic inflammation.

Foreign Bodies Back of the Vitreous.

1. May be in the retina, choroid, sclerotic, optic nerve or orbit. They may set up suppurative inflammation or become encapsulated.

Treatment.

Enucleation will depend on symptoms in each individual case.

Cysticercus.

1. May be found in the anterior chamber or vitreous.

Filari.

1. May be found in the eyelids.

Special Surgical.

Stye	(see page 76).
Chalazion	" 76
Entropion	" 76
Ectropion	" 76
Symblepharon	" 77
Ankyloblepharon	" 77
Trichiasis	" 75
Distichiasis	" 75
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General surgical principles.

DISEASE OF THE ORBIT.

General Surgical.

Foreign bodies.
Tumors, malignant and non-malignant.
Cysts.
Cellulitis.
Abscess.
Periostitis.
Exostosis.
Fractures.
Enchondroma.
Emphysema.
Angiomata.
Aneurism.
Cysticerci.

Treatment.

General surgical principles.

Blepharitis Marginalis.

1. SMALL FINE CRUSTS OR SCALES ALONG THE EDGES OF THE LIDS; EASILY DETACHED, AND DO NOT LEAVE A BLEEDING SURFACE.
2. NO ULCERATION AT ROOTS OF LASHES.
3. Edges of lids reddened.
4. Lashes are not destroyed by long-continued inflammation.
5. Trichiasis does not follow as a result of b. marginalis.

Treatment.

Correct error of refraction.

Blepharitis Ciliaris.

1. LARGE CRUSTS OR SCALES OFTEN MATTING OR GLUEING TWO OR MORE LASHES TOGETHER; WHEN THESE ARE DETACHED THE LASHES ARE USUALLY PULLED OUT, AND A BLEEDING SURFACE REMAINS.
2. ULCERATION AT ROOTS OF LASHES.
3. Edges of lids red and occasionally swelled.
4. Lashes are destroyed if disease is not checked; the lids become bald *(madarosis)*.
5. Trichiasis follows as a result of b. ciliaris.

Treatment.

Ung. hg. ox. fla. (gr. xii. vaseline ℥ i.) rubbed into edge of lids at night.

Trichiasis.

1. Tendency of the individual lashes to grow inwards, and rub on the eyeball.

Treatment.

Epilation.

Cautery to roots of inturning lashes.

Distichiasis.

1. There are two rows of lashes, and the inner row turns in towards the eyeball.

Treatment.

Operation.

Stye (Hordeolum).

1. ACUTE ACTIVE PROCESS.
2. PAINFUL.
3. Inflamed gland or hair follicle, or small abscess near margin of eyelid.
4. PUS FORMS.
5. Integument involved.
6. DURATION A FEW DAYS.

Treatment.

Attention to the general health.
Hot fomentation.
Incision.
Correct any error of refraction.

Chalazion.

1. CHRONIC SLOW PROCESS.
2. NO PAIN.
3. An enlarged meibomian gland, due to obstructed duct, and dilatation by its own secretion.
4. NO PUS, but secretion undergoes changes.
5. Integument not usually involved.
6. DURATION WEEKS.

Treatment.

Operation. Open sac and scrape it out thoroughly.
Correct any error of refraction.

Entropion.

1. Eyelid is inverted and the lashes rub against the ocular conjunctiva, or cornea, causing great irritation.

Treatment.

Operation.

Ectropion.

1. Eyelid is everted and the patient may be unable to close the lids. The cornea becomes dry, and ulcerative keratitis follows.
2. Not infrequently the punctum is drawn away from the eyeball and the tears are discharged over the edge of the lid and run down on the cheek (*epiphora*).

Treatment.

Operation.

Paralysis of Orbicularis Muscle (Lagophthalmus).

1. Due to lesion of the seventh nerve. Lids cannot be closed. Conjunctivitis and keratitis follow. Epiphora almost constant.

Treatment.

Directed to nerve lesion and protection of the cornea.

Spasmodic Contractions of Orbicularis Muscle (Nictitation), (Nervous Wink).

1. Frequent winking of the eyelids without apparent cause.

Treatment.

Directed to nervous condition.
Correct errors of refraction.

Ptosis.

1. Inability to raise the upper eyelid, either on account of paralysis or mechanical difficulties. May be congenital.

Treatment.

If paralytic, hg. bi-chl.
If mechanical, operation.

Xanthelasma.

1. Yellow patches of connective tissue, pigment, and fat, in the integument of the lids. Patches usually slightly elevated.

Treatment.

Operation to remove each patch.

Ankyloblepharon.

1. Adhesion of free edges of upper and lower lids.

Treatment.

Operation to free the edges.

Symblepharon.

1. An adhesion between the palpebral and ocular conjunctiva.

Treatment.

Operation to separate or break up the adhesion.

Inflammation of Lachrymal Gland (Dacryo-adenitis).

1. Symptoms are those of inflammation or abscess of the orbit, according to its severity, and can only be diagnosed by the location or point of greatest intensity.

Treatment.

Poultices, and if pus forms, sub-conjunctival incision.

Abscess of Orbit.

1. Similar to abscess of other parts.

Treat on general surgical principles.

Lach. Stricture and Watery Eye or Inflammation of Lach. Sac (Mucocele), (Dacryo-cystitis).

1. Epiphora, or, muco-purulent secretion between the lids; pressure over the sac causes the accumulated secretion to well up through the punctum. If punctum or stricture of canaliculus should close the exit upward, pus may accumulate in the sac *(abscess of the lach. sac)*, and it may rupture through the integument covering the sac, and leave a fistula *(lach. fistula)*.
2. A probe passed into canaliculus meets obstruction before entering sac, and usually one at the junction of sac and duct.

Treatment.

Pass probe through sac into duct.
Astringent collyria.

Abscess over Lach. Sac.

1. Similar to abscess of other parts.
2. A probe will pass into the lachrymal sac without meeting obstruction.

Treatment.

Poultice.
Incision.

Hypermetropia of 3. D or less (far sighted).

1. Vision good for distance.
2. Vision good for close work, until eyes tire.
3. Close work causes eye strain, blurred vision, etc. *(asthenopia).*
4. Distant vision does not cause asthenopia.
5. Vision at 20 feet as good, or better with convex glasses *(manifest hypermetropia).*
6. Vision may be as good with weak concave glasses. Not infrequently young subjects contract their ciliary muscle *(spasm of accommodation)*, and accept no convex glass *(latent hypermetropia)*, and may see better with a concave glass *(apparent myopia).*
7. Fine type can be read at 20 inches.
8. With the ophthalmoscope, the observer with a perfect eye *(emmetropia)*, who does not use his accommodation, should see the granular appearance at the macula (of the healthy retina), with the convex glass, which corrects the total hypermetropia.

If patient will not accept this glass, it shows *latent hypermetropia.*

Myopia of 3. D or less (near sighted).

1. Vision poor for distance.
2. Vision good for close work for almost any length of time.
3. Close work does not cause eye strain or headache.
4. Distant vision does not cause eye strain.
5. Vision at 20 feet not as good with convex glasses.
6. Vision improved with weak concave glasses.

If ciliary muscle is not relaxed a stronger glass will be required to see distinctly.

Anisometropia is not infrequent.

7. Fine type cannot be read at 20 inches.
8. With the ophthalmoscope the weakest concave glass with which the granular appearance of the retina can be seen corrects the myopia.

Hypermetropia of more than 3. D.

1. Vision not usually good for distance.
2. Close work causes asthenopia.
3. Vision improved with convex glass.
4. Vision impaired with concave glass.
5. In high degrees of hypermetropia, fine type may be read at ten (10) inches and cannot be read at 20 inches.

OPHTHALMOSCOPIC APPEARANCES:

6. The disc appears unusually small, often oval, and of a dark pink color, while the retina shows the granular appearance very distinctly.

   This condition of the disc is specially well marked in the high degree of hypermetropia following cataract extraction *(aphakial eye)*.

   It is not infrequent to find the vision of one eye very defective without apparent cause *(monocular amblyopia)*.

Treatment.

Order the strongest convex glass patient can see with distinctly at 20 feet.

Myopia of more than 3. D.

1. Vision never good for distance.
2. Close work does not cause asthenopia.
3. Vision impaired with convex glass.
4. Vision improved with concave glass.
5. In high degrees of myopia fine type cannot be read at ten (10) or more inches.

OPHTHALMOSCOPIC APPEARANCES:

6. The disc appears unusually large; frequently a staphyloma is seen on the temporal side (see pages 69 and 72).

   The retinal pigment (post. layer of retina) and choroid may be more or less atrophied, showing the choroidal vessels with the dark irregular interspaces. (The choroidal arteries and veins cannot be distinguished.) They are of a dark orange color and anastamose freely, giving the peculiar appearance known as the "*tiger skin fundus.*"

   If the atrophy has progressed further, black patches of choroidal pigment, and white patches showing choroidal atrophy, will be seen.

Treatment.

Order the weakest concave glass patient can see with distinctly at 20 feet.

Avoid all eye strain.

Hyperopic Astigmatism.

1. Javal-Scholtz Ophthalmometer gives the amount and axis of the corneal astigmatism.
2. A proper convex cyl. glass placed before the eye, and in the proper axis, should give normal vision at 20 feet distance ($\frac{20}{20}$.).
3. VISION MAY BE AS GOOD OR EVEN BETTER BY ADDING CONVEX SP. GLASSES *(compound hypermetropic astigmatism)*.
4. In a few rare cases the *astigmatism is irregular*, and no cyl. glass corrects it; these subjects occasionally complain of monocular diplopia *(polyopia)*.

OPHTHALMOSCOPIC APPEARANCES:

5. Disc appears oval.
6. If the accommodation of the observer is fully relaxed, the whole fundus cannot be seen distinctly with any one glass.
7. Retinoscopy reveals the fact that only one meridian is corrected by a sp. glass. Shadows reverse in one meridian first. (See page 82.)

Treatment.

Order full correction for the astigmatism and manifest hypermetropia.

Myopic Astigmatism.

1. Javal-Scholtz Ophthalmometer gives the amount and axis of the corneal astigmatism.
2. A proper concave cyl. glass placed before the eye, and in proper axis, should give normal vision at 20 feet distance ($\frac{20}{20}$).
3. A CONCAVE SP. GLASS ADDED TO THE CONCAVE CYL. MAY BE NECESSARY TO SECURE PERFECT VISION *(compound myopic astigmatism)*.
4. A few cases get the best vision by adding a convex cyl. glass; axis at right angles to the concave cyl. *(mixed astigmatism)*.

OPHTHALMOSCOPIC APPEARANCES:

5. Disc appears oval.
6. If the accommodation of the observer is fully relaxed, the whole fundus cannot be seen distinctly with any one glass.
7. Retinoscopy shows only one meridian corrected by a sp. glass. (See page 82.)

Treatment.

Order full correction for the astigmatism, and the weakest concave sp. patient can see with distinctly at 20 feet.

For mixed astigmatism order the strongest convex and weakest concave cyl. glass that will give good vision at 20 feet.

Retinoscopy or shadow test, with concave mirror.

1. Seated in front of the hyperopic subject (48 inches), get the red reflex and ROTATE THE MIRROR FROM RIGHT TO LEFT. A "SHADOW" APPEARS ON THE LEFT SIDE OF THE RED REFLEX, AND MOVES ACROSS IT TO THE RIGHT (*"moves against"*).

2. Over-correction with convex glasses causes a reversal of the shadows.

1. Seated in front of the myopic subject (48 inches), get the red reflex and ROTATE THE MIRROR FROM RIGHT TO LEFT. A SHADOW APPEARS ON THE RIGHT SIDE OF THE REFLEX AND MOVES ACROSS IT TO THE LEFT (*"moves with"*).

   If myopia is less than .75 D, the shadow "moves against."

2. Over-correction with concave glasses causes a reversal of the shadows.

PRESBYOPIA (Old Sight).

Presbyopia and Emmetropia or Hypermetropia.

1. Age over 38 or 40.

Treatment.

If hypermetropia is considerable, it is necessary to correct the error of refraction, as well as the failure of the ciliary muscle to affect the convexity of the hardened lens.

Add convex glasses until patient IS ABLE TO READ fine print at 9 or 10 inches.

Presbyopia and Myopia.

1. Age over 40 or 42.

Treatment.

If myopia is considerable, a weaker concave glass is required for close work than for distance. If myopia is slight, vision may be better without any glass, or possibly with a weak convex glass.

Anisometropia.

1. When there is a difference in the refraction of the two eyes amounting to 1 D or more, it is termed anisometropia.

Antimetropia.

1. When one eye is hypermetropic and the other myopic, it is termed antimetropia (Noyes).

Adduction.

To determine the adduction, place the apex of the prism over one internal rectus muscle (base out). The strongest prism which does not produce two images (*diplopia*) measures the adduction.

Abduction.

To determine the abduction, place the apex of the prism over one external rectus muscle (base in). The strongest prism which does not produce two images measures the abduction.

Sursumduction.

A prism with apex over sup. rectus (base down) measures the sursumduction of that side.

Deorsumduction.

A prism with apex over the inf. rectus (base up) measures the deorsumduction of that side.

DIPLOPIA.

Crossed Diplopia.

Eyes turn out, and the visual lines separate. If the left eye fixes an object the retinal image of the right eye is received on the temporal side of the macula, and is projected on the left side of the image seen by the left eye.

Homonomus Diplopia.

Eyes turn in, and the visual lines cross. If the left eye fixes an object the retinal image of the right eye is received on the nasal side of the macula, and is projected on the right side of the image seen by the left eye.

NYSTAGMUS.

Involuntary oscillating of the eyes.
Usually horizontal, may be rotary.
Always the result of defective vision.

Treatment.

If possible improve vision by aid of glasses.

Convergent Squint.

1. Only one eye fixes; the visual line or axis is directed to the object, while the other eye turns toward the nose.
2. The visual lines cross.

If the squint is recent, and not excessive, each eye may see the object, apparently in two places or positions *(diplopia)*. The right eye projects the object on the right side, and the left eye on the left side *(homonymous diplopia)*. (See page 83.)

Frequently the vision of one eye is poor, without apparent change in the retina *(amblyopia ex anopsia)*, and does not see or ignores the image. At times one eye may "turn," and the remainder of the time the other *(alternating squint)*, or, a portion of the time one eye "turns," and in the intervals both eyes are straight *(periodic squint)*.

Treatment.

Order full correction glasses.

Tenotomy of internal rectus, or advancement of external rectus, or both.

Divergent Squint.

1. Only one eye fixes; the other eye turns out and away from the nose.
2. The visual lines separate.

When there is diplopia, the right eye projects the object on the left side and the left eye projects the object on the right side *(crossed diplopia)*. (See page 83.)

Treatment.

Order proper glasses, usually myopic.

Tenotomy of external rectus, or advancement of internal rectus or both.

Vertical Squint.

(Strabismus Sursum Vergens) (upward squint),

or

(Strabismus Deorsum Vergens) (downward squint).

The superior or inferior recti muscles are at fault (weak).

Treatment.

Advancement of the weak, or tenotomy of the strong muscle.

Insufficiency of the Interni.

To determine insufficiency of the interni, place a prism of 10° before the right eye with the apex up. Ask the subject to look at a light twenty feet distant; two lights will be seen. The upper light will be projected on the left of a perpendicular line *(crossed diplopia).* A second prism over the left eye, apex out, which will bring the lights in a vertical line, measures the insufficiency, or *exophoria.*

Insufficiency of the Right Inf. Rectus, or Left Sup. Rectus *(Right Hyperphoria).*

To determine insufficiency of the right inf. or left sup. rectus, a prism of sufficient strength to cause marked diplopia is placed, base in, before the right eye. The light on the patient's right will be projected below the horizontal line. A second prism over the left eye, apex down, which will bring the lights on the same horizontal plane, measures the right hyperphoria.

Hyperexophoria, Right and Left,

As the names imply, are a combination of insufficiencies. The four preceding tables will explain these combinations.

Insufficiency of the Externi.

To determine insufficiency of the externi, place a prism of 10° before the right eye, the apex up. Ask the subject to look at a light twenty feet distant; two lights will be seen. The upper light will be projected on the right side of a perpendicular line *(homonymous diplopia).* A second prism over the left eye, apex in, which will bring the lights in a vertical line, measures the insufficiency, or *esophoria.*

Insufficiency of Left Inf. Rectus, or Right Sup. Rectus *(Left Hyperphoria).*

To determine insufficiency of the left inf. or right sup. rectus, a prism of sufficient strength to cause marked diplopia is placed, base in, before the right eye. The light on the patient's right will be projected above the horizontal line. A second prism over the left eye, apex up, which will bring the lights on the same horizontal plane, measures the left hyperphoria.

Hyperesophoria, Right and Left,

As the names imply, are a combination of insufficiencies. The four preceding tables will explain these combinations.

Treatment of Muscular Insufficiencies with Asthenopia.

1. Correct all errors of refraction, especially astigmatism, order tonics.
2. Systematic exercise of the weak muscle.
3. Prisms with the base over the weak muscle.
4. Tenotomy of the strong, or advancement of the weak muscle.

Paralysis or Paresis of the Internal Rectus Muscle.

1. CROSSED DIPLOPIA. (See page 83.)

2. Patient is directed to look at a particular object and apparently sees two *(diplopia)*. The diplopia disappears by turning the head to the left when the right internus is affected, and to the right when the left is affected.

3. If told to follow the finger, the eye affected WILL LAG BEHIND WHEN THE FINGER IS MOVED OVER, AND ON THE SIDE OF THE AFFECTED MUSCLE.

All of the muscles supplied by the third nerve are usually more or less affected. Not infrequently the branch which supplies the ciliary muscle is alone affected, causing *paralysis of accommodation.*

Paralysis of all the external muscles of the eye is termed *Ophthalmoplegia Externa.*

Paralysis or Paresis of the External Rectus Muscle. *(Paralysis of the sixth nerve).*

1. HOMONYMOUS DIPLOPIA. (See page 83.)

2. Patient is directed to look at a particular object, and apparently sees two *(diplopia)*. The diplopia disappears by turning the head toward the affected muscle. (Muscle is then completely relaxed).

3. IF TOLD TO FOLLOW THE FINGER TIP, THE EYE AFFECTED WILL LAG BEHIND WHEN THE FINGER IS MOVED OVER AND ON THE SIDE OF THE AFFECTED MUSCLE *(Paralytic squint).*

Paralysis of all the internal muscles of the eye is termed *Ophthalmoplegia interna.*

Treatment

Is directed to the cause, which is usually intracranial.

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